

AUTOMOTIVE INDUSTRIES

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A	B	C	D	E
94.50	(cost of 1 old die)			
x 13				
283.50				
94.50				
1228.50				
- 105.00	(cost of 1 new die)			
\$ 1123.50	(savings on die cost)			

A CHILD can see savings like these

In the production of steel parts, a Chicago manufacturer uses cold trimming dies, formerly made of oil-hardening steel. Much against his judgment, he was induced to use CROMOVAN TRIPLE DIE STEEL at three times the price.

The price was speedily forgotten when the CROMOVAN DIES were put into operation. Before they are scrapped, these Cromovan dies produce

about 2,000 pieces each (the average obtained from the old dies was about 150,000 pieces). It would require more than 13 of the old dies to give as much output as one CROMOVAN DIE. Thus the saving on die cost alone is \$1,123.50, not counting a considerable amount of labor saved in changing set-ups, grinding, etc.

Below we give a comparison of the CROMOVAN and the old dies:

	Old Die	Cromovan Die
Labor Cost.....	\$90.00	\$90.00
Steel Cost.....	\$ 4.50	\$15.00
Production Between Regrinds.....	7,500 pcs.	60,000 pcs.
Interval Between Regrinds.....	½ day	4 to 5 days

What can CROMOVAN do for you?

FIRTH-STERLING STEEL COMPANY

WORKS: McKEESPORT, PA.
GLOBE WIRE DIVISION
SHARPSBURG, PA.
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PHILADELPHIA CHICAGO
HARTFORD LOS ANGELES

Finding Foreign Outlets for American Production

Will depend more upon
natural economic and geo-
graphical factors in the future,
Foreign Trade Convention
hears + + + + +

THE world market for commodities manufactured in the United States has been only scratched, and America's participation in extended export business will be controlled only by increased advertising and sales promotion activities and our national tariff program, speakers agreed at the Seventeenth National Foreign Trade Convention, held May 21 to 23 in Los Angeles.

A roseate flush is given to the immediate outlook by the stabilizing influence of the Bank of International Settlements, \$100,000,000, recovery of important European industries and generally good crops throughout the world, as developed at the conference round-tables and general session addresses.

Exporters and bankers both pointed out that the current depression in foreign commerce is not to be considered as marking the end of expansion, but rather as a temporary halt, providing an opportunity to consolidate our position and to prepare for the future. It was regarded as the end of one era and the beginning of another, and it was pointed out that America must depend more largely in the future on natural economic and geographical factors, and less on the unnatural post-war situation in Europe, for foreign markets.

H. G. Brock, vice-president, Guaranty Trust Co., New York, and Edward A. Sumner, vice-president, American Chamber of Commerce in France, pointed to "political obstacles which pre-

**America, in the future,
must depend more upon
natural economic and
geographic factors for
foreign markets.**





Inestimable international good-will has been developed through exchange scholarships in universities.

sent themselves" in export trade and challenged industry generally to consider the difficulties presented in ever-changing tariff schedules here and abroad.

"Despite the fact that economists, financiers and industrialists with international viewpoints have tried to remove some of the trade barriers that have hampered the flow of goods between countries, the world is being swept by a tide of protectionism," Mr. Brock said. "In some respects, the present position of Europe is similar to our own position in the early days of our industrial development, and the same means are being used to meet the situation. Tariff barriers are being

EXPORTS for 1930 thus far are below those for the same period in 1929.

They may be off for the whole year, but they will come up again.

Consistent advertisers will enjoy results contrary to the general export trend, or experience a far slighter recession in their foreign sales.

erected in an effort to foster the growth of an enfeebled industrial system.

"Whatever the immediate tangible effects of such measures may be, the rising tariff walls are indicative of an attitude that is sure to shape the commercial policies of European countries in coming years and is sure to represent an added problem with which our credit and financial executives must contend."

"Economic statistics indicate some of the difficulties as well as some of the fallacies of national aspirations toward economic independence resulting in frequent and extreme tariff changes," Mr. Sumner said. "It is evident that some countries are laying stress on the effect rather than the cause of those economic differences which tend toward raising tariff barriers."

"Perhaps all countries would do well, now that currency conditions are more stable, to concentrate on business economics, on productivity and the purchasing value of wages and so help to equalize the conditions, the variation of which now causes certain countries to protect their national standard of living by the raising of barriers against other nations."

Threat of Retaliation

"If the United States puts a 50 per cent duty on some commodity, we are apt to be met with a similar duty on automobiles. If we bar the product of another country, we are apt to find our film industry blocked abroad, and often the retaliation is effective before the threatened duty which prompted it becomes law."

"I don't consider that United States industry is still a babe in arms. If we have cut our second, and perhaps even our wisdom teeth, then when our merchants go to their representatives in Congress it would be well if they kept in mind that we have other industries which can develop the market more advantageously for local consumers by also doing an international business, and only by reasonable conditions and fair exchange can either side attain the maximum benefit," he declared.

The prime essential of success in export business is the establishment of suitable representation abroad, William L. Cooper, Director, Bureau of Foreign and Domestic Commerce, Department of Commerce, Washington, told the convention.

"A company's foreign representation, in the largest sense, is not merely a matter of its branches, agents or travelers in other countries," he said. "Some of the saddest cases of failure among American exporters that have come to my attention during my own years abroad have been due to nothing but the fact that the executives of companies back home would not believe that the same methods which worked successfully in the home market would not apply equally well to all other countries of the world."

"This sort of failure can be avoided by a definite separation of the export organization from the domestic sales organization."

Managers Domestic Minded

"Many of our companies are still organized in such a way that the export sales are merely a branch of the general sales organization; and as the domestic sales comprise about 90 per cent of the total, the general sales manager is primarily domestic-minded and probably has neither time nor inclination to study export technique and problems, which he probably even regards as a nuisance."

"In my opinion, both the export and domestic sales departments should be under separate managers who will report directly to the chief executive."

Two things which should be avoided, Mr. Cooper said, were first, the appointment of an agent whose personal character is other than excellent; and second, permitting a foreign representative to cover more territory than can be done efficiently.

A new note in foreign trade sessions was sounded by Mr. Brock, who said that in the long run, Europe will probably not offer the most remunerative field for the investment of American capital, as it has in the last decade; and we must look elsewhere for opportunities to invest our funds. To the extent that foreign countries continue to provide such outlets, our export trade balance in commodities can be maintained, he said.

"Little by little, European countries will probably be supplanted by the nations of the Southern Hemisphere of the New World, and the Far East, as the principal sources of demand for American capital and American goods. But these fields for investment and export cannot be developed with the small amount of effort that has sufficed to respond to the desperate need of Europe during the last 10 years.

"To appreciate the true significance of this prospect, we must rid ourselves of the fallacious view that the restoration of European industry will, in itself, result in the destruction of our foreign markets, and that our loans to Europe are suicidal because they promote this restoration. As long as the world's consuming capacity is larger than its producing capacity—and that will probably be forever—there will always be a market for all the goods that can be produced, provided the right goods are produced and the right outlets are found.

"Our problem in coming years will be to produce the right goods and to find the outlets for them, changing the directions of our productive effort as this is made necessary by the changing character of our markets. By using all the productive and distributive facilities at our disposal, coupled with a broad-minded and intelligent appreciation of the changing credit requirements of foreign customers, we can retain some of the foreign markets that were thrown in our laps as a result of the economic paralysis of Europe due to the World War. For the rest, we must seek new outlets, not a few of which will be found in the restored Europe itself."

Advertising Cost Greater

The ratio between advertising costs per \$100 worth of sales is four times as large in the United States as in the foreign markets, taking the estimates made by concerns who do extensive domestic and foreign sales promotion work, according to Eric T. King, Chief, Specialties Division, of the Bureau of Foreign and Domestic Commerce.

"The automobile man will probably feel that he is doing his bit, for without attempting to cite figures it suffices to say that advertising abroad of American motors is proverbially well done and well sustained," he said. "It is probably true that American advertising of automotive products is the chief sustenance of many a foreign publication catering to the trade and to the motoring public. This is one contributing factor to the predominance of American cars abroad.

"Unquestionably some American producers have tried the experiment and found it good, have adjusted their expenditures in the light of actual results, and

ADVERTISING is an indispensable adjunct of commercial progress. Its power is growing steadily greater.

"Here at home we have this typically American power of advertising well in hand.

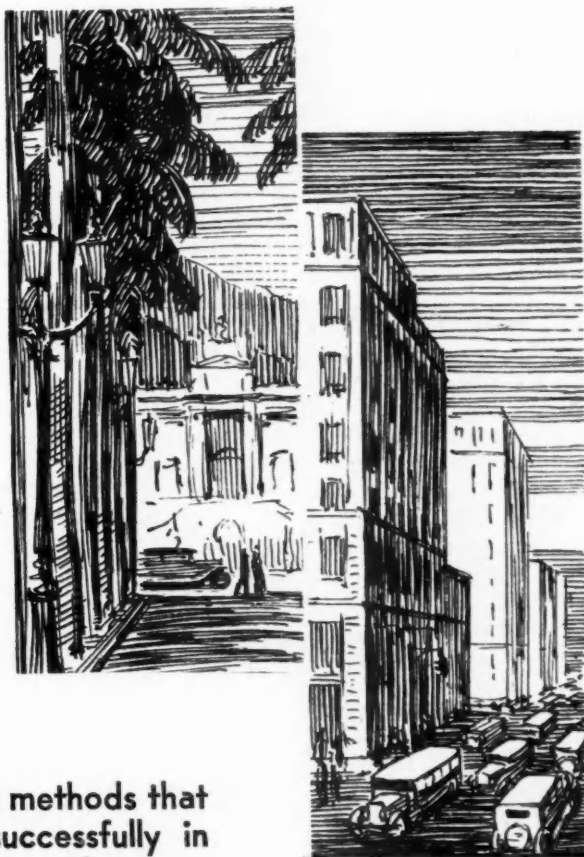
"Let us see that it is felt increasingly in the foreign field."—Dr. Julius Klein.

some few have arrived at quite definite policies, formulae and practices for their export advertising.

"Latin America, though fourth best regional market for American manufactured goods (Europe, North America and Asia all buy more from us), is of particular interest to the American advertiser.

"A British analyst says we spend \$15,000,000 annually in advertising there, or 10 times what the United Kingdom does. He says we buy 100 in. to every eight that Great Britain does. We are heavy

(Turn to page 849, please)



The same methods that worked successfully in the home market may not apply in all countries of the world.

Replacement Business Race



VEHICLE manufacturers have been berating vendor parts manufacturers for competing with them in the replacement field. Some vehicle customers have even gone so far as to suggest to some parts vendors that if they don't get out of the replacement field, said vehicle customers will change to other sources of supply or make their own parts.

Not a particularly pleasing situation, looked at from the standpoint of the vendor parts manufacturer, however much of logic he may feel to be on his side of the argument which usually has ensued. Experience has taught that business actions sometimes are taken without regard to logic. Strange, but true.

What's the vendor going to do?

No single answer can be given to that question. It's our guess that the ultimate action of any particular vendor will depend on:

First—What percentage of his total dollar volume today consists of replacement business sold through channels other than his vehicle customers;

Second—The mechanical nature of his product; how likely the vehicle maker is to carry out a threat to manufacture himself;

Third—The character of his competition for original equipment business; are his chief competitors also in the replacement field;

Fourth—The probable stability of his original equipment business.

Upon a concurrent weighing of the answers to these four questions, it would seem, individual vendor parts makers are likely to base final decision as to action in such instances as a final, definite decision becomes necessary. Such decisions probably will be unnecessary in a majority of instances. The issues are not clean cut in most instances and seem unlikely to become so in the near future.

Vendors seem inclined, at the present time, to argue out each individual case on its merits as it arises,

ACTION of each parts maker likely to depend on strength of his individual position.

rather than to open the whole question for general discussion. There is much to be said for the soundness of this attitude and this method of procedure, because so much does depend on the circumstances surrounding the individual case.

Certain general principles surround every discussion between vendors and vehicle makers as regards replacement parts business, however, which automatically tend to come up before individual considerations become involved at all. A good many of these are brought out pretty well in the following digest of a conversation which took place recently between representatives of a prominent vendor parts manufacturer and a leading automobile manufacturer.

"Biting the Hand—"

"You are competing with us for replacement parts business," the car manufacturer began. "Why should you do this when we are buying from you and when we are a good customer of yours? You're biting the hand that's feeding you."

The vendor's answer was something like this: "Our presence in the replacement field affects the total volume of your replacement business to a negligible extent. If we got out of the replacement field today, you wouldn't get any more of the business than you now are getting. What we gave up would go to independent parts manufacturers.

"At least we are assuring the use of more 'original

is to the Swift

parts' in such of your cars as are repaired in independent repair shops than otherwise would be possible. You will admit that the amount of parts sold through your dealers to independent repair shops isn't very great."

Car Manufacturer: "Yes, but we as car manufacturers created this market for you by building and selling our vehicles. We have a right to the replacement market; you shouldn't compete with us for it."

Chance for Independents

Vendor Manufacturer: "Again, elimination of us from the picture under existing conditions will give the market to independent parts makers, not to you. You may have a right to the business, but elimination of us from the picture won't give it to you. We really are protecting both you and the owners of your cars by our replacement activities."

Car Manufacturer: "Well, in certain territories our dealers tell us that you are selling to our dealers cheaper than we sell to them. Do you countenance that; do you think that is fair?"

Vendor Manufacturer: "No. We are against cut prices, not only because we think they are unfair to you, but also because they get us in trouble with other jobbers sooner or later. We do everything we can, legally, to control this situation. We cannot control entirely, however, the price at which the jobber sells. After all, it's a free country. You can count on us, however, to do everything we can to prevent our units being sold to your dealers cheaper than your dealers can buy through your own distributing channels. We are not out to undersell you on a price basis."

Car Manufacturer: "Well, we don't think you ought to be competing with us anyhow. Maybe we will have to take our original equipment business elsewhere or go back to making the unit ourselves."

Successors Scarce

Vendor Manufacturer: "Naturally we don't want you to do that. We've invested a good bit in obtaining your business and your good will. We've tried to serve you quickly, efficiently and to give you good quality over a considerable period of time now. Besides, you will have a hard time finding any other vendor of sufficient size and stability for you to want to do business with who is not also in the replacement field just as we are."

"Of course, you could go back to making the parts yourself. . . ."

Doubtless plenty of other points were labored in this discussion, but the foregoing give a fair picture of the lines along which current debates are going.

Should the car maker really consider going back to way or the other, because:

Either it is inconceivable that the average vehicle

Parts makers contend soundness of vehicle manufacturers' position on after-market for parts is questionable.

By Norman G. Shidle

production of certain units himself, he is likely to think some time before doing so about such items as inventory, tool investment, plant capacity and so forth. This phase of the economics, however, concerns the car makers thinking directly and for that reason will be discussed more fully in next week's article rather than here.

Behind all such basic discussions there must be going on in the mind of the individual vendor manufacturer specific consideration of his own current situation and future possibilities.

Certain groups of parts vendors, for example, seem unlikely to be affected by these current arguments one

PASSENGER car manufacturers, seeking to regain markets lost to the independent parts makers, having a difficult condition confronting them—

A SERIES of four articles reflecting vital phases of the situation have been written

They are—

"Who Takes the Trick?"

(Published May 17th)

"Parts Suppliers Bolster Vehicle Makers' Markets"

(Published May 24)

"Replacement Business Race is to the Swift"

(Accompanying Article)

"Gear Sales to Maintenance"

(June 14)

maker could set up to produce the particular unit;

Or the vendor's profit from his replacement business is relatively so very much larger than that from his original equipment business as to make any action on the part of the vehicle maker a matter of relatively small moment to him one way or the other.

Manufacturers of tires, spark plugs, etc., probably are outstanding examples of vendors who are included in this latter happy classification—happy, at least as viewed from the standpoint of the vendor.

At the other end of the spectrum we find certain types of vendors who have already been glad to confine their entire replacement parts distribution to vehicle manufacturer channels. Several truck axle manufacturers are now to be found in this group, for example. In most of such cases the percentage of replacement business which had been obtained in the past through other than vehicle manufacture channels was so small as to be negligible when compared to the original equipment volume.

Problems Individual

But in between these two extremes lie a majority of vendors, with individual percentages of replacement volume, individual stabilities or instabilities as regards their original equipment business and, consequently, individual problems to decide in meeting current pressures.

The stability of original equipment accounts undoubtedly will bulk large in the eyes of many vendor executives. It is all very well, they will argue, for our present customers to ask us to cooperate by getting out of the replacement field except for such parts as we sell through them. Suppose our customers did get up to do a real merchandising job on parts; and suppose we did have a reasonable chance of selling as great a volume of replacement business through them as we do now in total (which is not the situation by a long shot). Even then, where are we in the future if we lose that particular account? We have not only lost the dealer business of that manufacturer, but also a good trade with independent repair shops which we had already built up.

The independent repair shop business—and it's a big, growing business—if properly cultivated will always be largely in the hands of the independent parts maker—vendor or non-vendor—regardless of anything vehicle manufacturers seem likely ever to do. There are some 50,000 of those units alone. "Building and maintaining my market in that field, I have my business eggs in some 50,000 baskets, all of which never will break at once. I've had big original equipment accounts leave me for a few cents in price on more than one occasion. Stability is a big factor. I've got to be careful of those business eggs."

Reducing Prices

True, the car manufacturer is going out after replacement business, both from his own dealers and from independent repair shops, more vigorously than in the past. He used to have such high prices that any reasonably efficient independent parts maker could undersell him with a product of equal quality without much difficulty. That's not true any more, except on a limited number of items sold by certain car manufacturers.

On a large majority of parts the car manufacturer today has his prices down to where they offer real competition for even the efficient independent parts maker. Even so, however, it is doubtful if the car manufacturer will be able to make many inroads on

the replacement business among independent repair shops and garages. Some have lengthened discounts recently to make a try for this business, but merchandising effort and availability probably are factors too strong to be overcome by price or discounts alone. At any rate, that is the view of most experienced independent parts manufacturing executives.

On the whole, then, it would appear as though relatively few vendor parts makers will find it sound business to withdraw from the replacement field merely because of pressure from vehicle manufacturers; and it is highly questionable as to whether or not the vehicle manufacturers themselves—as matters stand today—would not rather be hurt than helped by such withdrawal.

A few parts executives would like to see the whole matter made one for general discussion between some committee of the National Automobile Chamber of Commerce and committees of parts and accessory organizations. A majority, however, seem to feel that individual handling of individual cases as they arise constitute the best means of practical adjustment in the immediate future.

And there is a well-defined feeling among many executives that, if vehicle sales should suddenly spurt upward as summer comes on, the whole argument might be found relegated to the background again.

Torsional Strength Measurement

A NEW method for determining the torsional resistance factors of complicated sections was applied recently by the Forest Products Laboratory, Madison, Wis., in solving some problems submitted to it by the United States Bureau of Aeronautics. The problem was to determine the relative torsional strengths of a number of aircraft structural members. The method employed may be briefly described as follows:

Take a beam of any shape of cross section and imagine it to be completely hollowed out and used as a pipe to blow bubbles with. Blow the bubble out only far enough to take a sort of flat pincushion shape. The air capacity of this bubble is a direct measure of the twist resistance of the solid beam.

This curious fact, discovered by a German physicist some years ago, was the clue used by the laboratory in solving the Navy's problem. Instead of building and breaking numerous expensive beams, they cut holes in aluminum plates of the same shape and size as the cross sections of the various designs of wing beams. Bubble films were spread over the holes, the films were inflated slightly, and their capacities were then measured by contact with a sharp-pointed micrometer screw. From the volumes of the bubbles the twist resistances of wing beams of different shapes were determined within a limit of error of 4 per cent.

The experiments succeeded only with very "tough" bubbles. It was found that triethylaminoleate with water and glycerine gives puncture-proof bubbles that stand for hours.

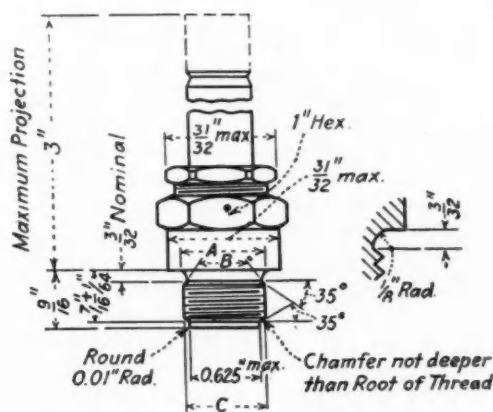
MANUFACTURE and Properties of a Cellulose Product (Maizolith) from Cornstalks and Corn-cobs, by C. E. Hartford, is the title of Miscellaneous Publication No. 108 of the Bureau of Standards. Maizolith is a product developed at Iowa State College, Ames, Iowa, under the direction of Dr. O. R. Sweeney, in cooperation with the Bureau of Standards.

Sharp clash on metric spark plugs for automobiles develops at meeting. Aircraft division proposed anti-friction-bearing pulleys for control cables.

The Lubricants Division had had a meeting at Detroit a few days previously and a number of changes in the

The Aircraft Division proposed the cancellation of the present S.A.E. standard for ball hexagon bolts and nuts, which are no longer being used in aircraft construction.

A series of anti-friction-bearing pulleys for control cables, similar to an already existing series of plain-bearing pulleys, and an additional 5-in. size of plain-bearing pulley, all of non-metallic material, were proposed, the outside diameters ranging from 2½ to 5 in. To insure uniformity in dimensions, strength and streamline, a standard for streamline tie rods was proposed. The strengths range from 1000 to 24,700 lb. National fine pitch threads are used for these tie rods, with Class 3 tolerance, and it is specified that the rods must withstand nine 90-deg. bends without failure, the bends to be back and forth through 180 deg. Dimensions for plain pulley spacers were also recommended as an S.A.E. standard. A table of dimensions for internal tie rods provides seven sizes ranging in



Proposed Standard Metric Spark Plug for Automobiles

The thread diameter is 18 mm. and the pitch is $1\frac{1}{2}$ mm. The thread form is the international standard, which is similar to the U. S. standard except that the truncation at the root is only one-half as much. Limits on dimensions A, B and C are as follows: A, 0.709-0.728; B, 0.625-0.633; C, 0.703-0.708

strength from 1000 to 15,500 lb. In this case it is specified that the rod must withstand seven 90-deg. bends without failure. A further standard proposed related to flat-head clevis pins.

The Aircraft Engine Division submitted dimensions for an additional shaft end, to be known as S.A.E. Standard shaft No. 50. It is intended for larger engines and is identical with the shaft end of the geared Hornet engine. Cones and nuts are used for fastening propeller hubs on splined shaft ends, and a first attempt to standardize these cones and nuts was made in the report of this division. Dimensions for five cones and five nuts were given in tables, each size bearing the same number as the shaft end to which it corresponds. The Aircraft Engine Division also proposed a tapered and keyed shaft end for small engines of the type which are now being developed for light planes. The shaft end is to be known as No. 0 and will have a maximum diameter of $1\frac{7}{8}$ in.

Ball Bearing Additions

The Ball and Roller Bearing Division submitted new tables of dimensions for open-type and angular-contact-type ball bearings which give inch equivalents for the metric dimensions, new tolerances, new corner radii, and new eccentricity tolerances. A revised standard for single row annular ball bearings which forms virtually an international standard was adopted some years ago, and the present recommendation of the division is intended to bring the standard for the open-type and the angular-contact-type in line with this standard for single-row annular bearings.

At the last meeting of the Standards Committee, in January, a proposed standard for metric spark plugs for automobiles was referred back to the Division by reason of differences of opinion developing at the meeting. The subject had been reconsidered since that time, and although the subdivision which handled the matter was not unanimously behind the new proposal, it had received strong support by letter ballot from the Electrical Equipment Division and the Gasoline Engine Division. The new proposal is embodied in the accompanying drawing.

The Lighting Division recommended that the following paragraph be added under the heading "Scope of Specifications" in the Specifications of Laboratory Tests of Optical Characteristics of Electric Headlamps for Motor Vehicles:

"In view of the fact that the headlighting art is a developing one, these specifications are necessarily of a temporary character and are subject to revision from time to time. It follows, therefore, that while they are applicable to use in connection with regulation by State authorities having administrative powers, they are not suitable for inclusion in State laws where the requisite flexibility of revision is absent."

Laboratory Tests for Lamps

This Division also proposed new specifications for laboratory tests of optical characteristics of electric signal lamps for motor vehicles, an earlier recommended practice covering this subject having been found unsatisfactory and cancelled some time ago.

The Motor Coach and Motor Truck Division recommended that the present Recommended Practice for Motor Coach Specifications be cancelled. The reason for this action was that a Committee of the N.A.C.C. had drafted a motor coach specification code which included all items that would ordinarily be included in

state regulations and indicated those which the committee felt are the only ones that should be controlled by state regulations. The final draft of this code was approved by manufacturing and operating interests at a meeting in Washington, D. C., June, 1929, and the S.A.E. and other bodies were asked to give the code their support, which led to the request for the cancellation of the S.A.E. Recommended Practice.

A quite lengthy report was submitted by the Non-Ferrous Metals Division and related entirely to aluminum alloys. It included proposals for revisions of some alloys already standardized and specifications for new alloys. A No. 36 alloy was proposed which differs from the present No. 30 only in that iron and silicon are added in carefully controlled amounts instead of being allowed to vary at random within the range allowed for impurities. The range for silicon is 1.0 to 1.5 per cent, and the range for iron, 0.8 to 1.4 per cent. This alloy is said to largely have taken the place of No. 30 and to be better suited, particularly for the more difficult castings that call for high pouring temperatures. An alloy No. 31A was proposed, which contains 2.0-3.5 per cent copper, 9.0-11.5 per cent zinc, 1.25-1.75 per cent iron not over 1.0 per cent other impurities and the rest aluminum. This alloy is used when somewhat higher mechanical properties are desired than are obtainable with Nos. 30, 33 and 36.

Another new alloy, No. 37, which is said to be specially resistant to salt-water corrosion, contains 12.0-13.0 per cent silicon, 0.8 per cent maximum iron, 0.3 per cent maximum copper, 0.2 per cent maximum zinc, 0.5 per cent maximum manganese, not more than a trace of magnesium and 0.3 per cent maximum total other impurities.

Heat Treating Alloy Castings

Proposed specification No. 38, for heat-treated castings, provides for 4-5 per cent copper, 1.20 per cent maximum silicon, 1.20 per cent maximum iron, 0.25 per cent maximum zinc, and 2.5 per cent maximum total other impurities. Where maximum toughness and resistance to shock are desired, a solution heat-treatment alone is used, which produces in sand-cast test specimens tensile strengths of from 28,000 to 38,000 lb. p. sq. in. and elongations of 6 to 12 per cent in 2 in. On standing at room temperatures there is an aging effect which is practically complete in two months. The tensile strength increases by a few thousand lb. p. sq. in. and the elongation decreases by a few per cent. The greatest change is in the yieldpoint, which increases to a value usually in excess of 20,000 lb. p. sq. in.

Alloy No. 39 contains 3.75-4.25 per cent of copper, 1.8-2.3 per cent of nickel and 1.2-1.7 per cent of magnesium and has the iron and silicon limited to small amounts. This alloy when cast in sand and after proper heat treatment shows 30,000-42,000 lb. p. sq. in. tensile strength and 0-2.0 per cent elongation. Other alloys which it was proposed to standardize and for which specifications were submitted included duralumin or 17S, 25S, 51S and an alloy containing 1.0-1.5 per cent of manganese and not over 0.2 per cent of copper, which is used in place of pure aluminum. A number of changes in the present aluminum alloy specifications were also proposed.

The Screw Threads Division proposed a standard for round-unslotted-head bolts of the automobile type. This type of bolt is specially adapted for use where the bolt goes through wood.

HOW'S BUSINESS? GOING TO BE NEXT MONTH

CHARTED BY BUSINESS PUBLISHERS, Inc.

THIRTY-FOUR ECONOMIC EXPERTS—EDITORS OF BUSINESS PAPERS PUBLISHED BY THE *United Business Publishers, Inc.*—HERE PRESENT A COMBINED OPINION ABOUT THE COURSE OF BUSINESS DURING THE MONTH OF JUNE. GOVERNMENT AND OTHER RECORDS PROVIDE YOU WITH HISTORY OF RECENT MONTHS. THIS BOARD OF EXPERTS DEALS ONLY WITH THE FUTURE. ITS OPINIONS ARE BASED ON CLOSE CONTACT WITH THE MORE THAN 400,000 SUBSCRIBERS REACHED BY THEIR PUBLICATIONS IN FAR-FLUNG FIELDS OF RETAILING AND INDUSTRY.

Money is cheap, but equally cautious. It is reported that some banks and loan agencies, however, have reversed their policies and are now seeking outlets in home-building projects. In the merchandising field funds are available, but buying is waiting upon consumer acceptance of new merchandise. Manufactured goods continue to show, with but few exceptions, conservative inventories, in contrast to over-production and price distress in many lines of raw material.

Indications are that the public is still buying only the things that it needs. Group action which did much to maintain confidence, now passes the burden of improve-

ment to individual action. The tariff is still a cloud of uncertainty in many minds, and expansion in affected lines marks time until the tariff weather is more settled.

Comparison with other years than 1929 would show contemporary progress in a better light, and the criticism of "stabilization" schemes would seem to indicate that economists and bankers are inclined to allow the law of supply and demand to work unhampered.

With a better showing of individual confidence all along the line it is hoped that June may be a month of substantial, if moderate, progress.

THE COURSE OF BUSINESS FORECAST FOR NEXT MONTH

BUSINESS	SALES	RETAIL STOCKS	COLLECTIONS	COMMENTS
AUTOMOTIVE	June 15% less than May. (Normal seasonal decline); 15%-20% less than June, '29.	Small seasonal decrease in new car stocks from May, substantially lower than June, '29. Used car stocks unfavorable, but showing improvement.	June collections about the same as May, somewhat slower than June, '29.	Sale of materials and services for operation and maintenance exceed amount of new vehicle sales.
DEPARTMENT STORES	Slightly less in June than in May; about 6% less than June, '29.	Slightly less in June than in May; about 2½% less than June, '29.	Slight improvement in June over May; but about 5% behind June, '29.	Reasonable interest by consuming public in new merchandise will open up buying for stock replacement.
HARDWARE	June will show slight but definite improvement over May. 5%-10% lighter than June, '29.	Will show little difference in June over May. Stocks lighter this June than in June, '29.	Will improve in June over May, but noticeably lighter than June, '29.	Tools, building supplies, will begin to move with cheaper money. Trade generally optimistic for last half of year.
INSURANCE	Life insurance slightly better in June. Fire and Casualty lower. All three slightly better than June, '29.	....	Steady on all three lines in June. Life same as June, '29. Fire and Casualty slower.	Life insurance still benefits by uncertainty of stock speculation.
IRON AND STEEL	Steel production about 5% lower in June than in May, about 15% under June, '29.	....	....	Steel industry is moving toward dull summer season, but may come close to duplicating 1928 performance.
JEWELRY	Silverware, jewelry, watches, novelties better than May, diamonds about same. All lines less than June, '29.	Slight increase in silverware; jewelry and watches same; diamonds smaller. All lines lighter than June, '29, particularly gems.	Slow, spotted.	Graduations and weddings make June second best gift month. Proposed 10% decrease on diamond tariff slowing up diamond buying.
PETROLEUM (Motor Fuel)	Estimated increase of 1.6% in June over May; increase of 8.9% over June, '29.	June will show estimated decrease of 5.7% over May; increase of 13.6% over June, '29.	Fair.	Anticipated profits for June better than May, and possibly better than June, '29.
PLUMBING AND HEATING	New building low; replacement and jobbing improving. Total business below June, '29.	Retail stocks unimportant, most goods bought as needed.	United drive through-out the industry is showing improvement.	Replacement business on time-payment basis backed by leading manufacturers offers encouraging outlook.
SHOES	Slight increase in June over May. Sales this June about equal to June, '29.	Less than in May, except on summer "cool specialties"; standard goods less, fancy goods more than June, '29.	More cash sales on novelties; credit restrictions lifted, more long datings given, fewer discounts taken.	Shoe production off two million pairs monthly. Low inventory point at retail just ahead.

Anti-Knock Fuel Values Cannot

Results vary with jacket and throttle position, S. D. meeting of A.S.M.E. P. B. radial engines. Fire pre

By P. M.

ONE of the popular automotive theories of the past decade, that the anti-knock value of any fuel can be definitely expressed in terms of an arbitrary scale, was shown to be untestable in a paper presented at the Fourth National Aeronautic Meeting held under the auspices of the American Society of Mechanical Engineers at Dayton, Ohio, May 19-22. The paper referred to was by S. D. Heron, mechanical engineer of the powerplant branch at Wright Field. It has been known that results often vary considerably if the anti-knock value is determined by apparatus of entirely different design, but Mr. Heron showed that even when determinations are made with the same testing outfit, the results vary with the jacket temperature, engine speed and throttle position.

On each of the four days of the meeting a morning session was held at the Hotel Dayton-Biltmore and an afternoon session in the auditorium at Wright Flying Field. Inspections of various departments of the Material Division at Wright Field were arranged and on Wednesday afternoon flying demonstrations were given there with the various types of crafts in use at the field from the small training plane to the large bomber.

On Monday evening Capt. A. W. Stevens of Wright Field gave an illustrated talk on "Accomplishments and Possibilities of Aerial Photography," in the course of which many beautiful photographs taken in the mountain regions of the western United States were projected on the screen. On Tuesday evening there was a musical and dancing review at the Dayton Engineers Club, and on Wednesday evening the National Aeronautical Banquet was held at the Dayton-Biltmore. Brigadier-General B. D. Boulois and Orville Wright were guests of honor at the banquet, and addresses were made by C. F. "Casey" Jones, president of the Curtiss Flying Service, and Sir Captain Hubert Wilkins, Arctic and Antarctic explorer.

The program of the technical sessions was a varied one, covering every phase of air activities—design,

production, phases of maintenance, operation and air law. No less than four papers on production problems were read. Nearly 250 registrations were booked. The next meeting will be held at Baltimore, it was announced.

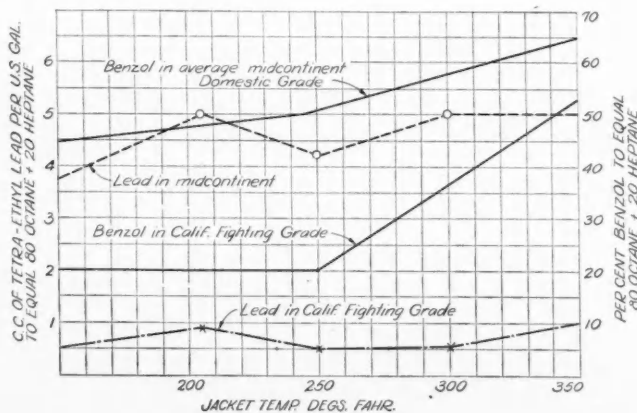
Mr. Heron in his paper said that straight-run Mid-Continent domestic aviation gasoline, which until recently was the fuel most widely used in American aircraft engines, is an exceeding poor fuel from the anti-knock standpoint. In the past, when a superior fuel was required, the addition of benzol to the above was general. With increase in compression ratio, volumetric efficiency and cylinder wall temperature, Mid-Continent D. A. G. has ceased to be a satisfactory fuel for aircraft engines, and much of the latest equipment of the Air Corps will not operate satisfactorily on it even if the throttle is not fully opened below 5000 ft. altitude. Pending the arrival of better fuel the Air Corps decided to add 3 c.c. of tetra-ethyl lead per gal. to all gasoline for use in such equipment.

The author pointed out that the relative anti-knock values obtained for different fuels depend upon the conditions of the tests. During the latter part of 1928 the Material Division, partly as a result of its work with high boiling-point liquids, found that cylinder temperature has a marked effect on relative fuel ratings. Using the Ethyl Gasoline Corporation's test engine and the bouncing-pin knock detector, it was found that the amounts of benzol and lead required

in two different gasolines to make them equal to a standard consisting of 80 parts (by volume) of trimethyl pentane and 20 parts normal heptane, varied with the cooling liquid temperature as shown in Fig. 1 (circulating evaporative cooling being used). The results were checked and confined in a general way by other laboratories. The outstanding feature is the rapid relative loss of anti-knock value of benzol with increase in cylinder temperature. Other synthetic aromatic compounds (ethyl benzene and a mixture of alkyl benzenes) showed similar properties.

The results plotted in Fig. 1 indicated that, with the wide varia-

Fig. 1 — Dependence of dope addition required on cooling jacket temperature



be Expressed by Arbitrary Scale

temperature, engine speed
Heron tells Aeronautic
Taylor talks on installing
vention methods discussed

HELDT

tion in cylinder temperatures, fuel-test-engine conditions should be so adjusted as to strike an average of the relative effectiveness of widely varying fuels as determined in multi-cylinder aircraft engines. The Material Division has started a program to determine the relation between the anti-knock effects of widely-different fuels in multi-cylinder aircraft engines. The relation between fuels is obtained by determining for each the amount of anti-knock that will give maximum output, minimum fuel consumption and minimum cylinder temperature with the mixture so "leaned" that the power obtainable is 1 per cent less than the maximum for any mixture proportion. When sufficient anti-knock has been added, maximum power, minimum fuel consumption and minimum cylinder temperature are usually reached at the same time. For all single-cylinder-engine tests of fuels the Material Division uses the particular mixture ratio which has the greatest tendency to knock.

To be able to measure small differences in knock-value with greater accuracy, three types of thermocouple plugs were constructed which could be screwed into the combustion chamber wall of the single-cylinder test engine in place of the bouncing pin. All showed a minimum change of 3 deg. Fahr. for a change from 3 to 3½ c.c. of tetra-ethyl lead to several gasolines. Occasionally fuels were found which, when matched by the bouncing-pin method, did not match by audible knock on cylinder-head temperature.

Using the temperature plug in a Series 30 ethyl gasoline knock-test engine, the Material Division obtained the tetra-ethyl lead equivalent of 50 per cent C.P. benzol in a California fighting grade and a Mid-Continent domestic aviation gasoline at cooling liquid temperatures varying between 150 and 400 deg. Fahr., and the results, plotted in Fig. 2, indicate very large variations with change of cylinder temperature.

The author also presented data obtained by the Ethyl Gasoline Corp. on the effect of engine speed and throttle position on the fuel rating by both the bouncing-pin and the temperature-plug methods,

and remarked that while some investigators had expressed the anti-knock value of fuels to a degree of sensitivity of considerably less than ½ per cent benzol, in view of the effects of cylinder-wall temperature, engine speed and throttle position on this value, as shown by the experimental evidence submitted, the usefulness of such sensitivity appeared to be open to doubt. The conclusion may be drawn that it is not possible to do much more than generalize upon the subject of anti-knock values of fuels and that a large amount of multi-cylinder engine data will be necessary for a complete understanding of the problem.

The Material Division hereafter will adopt the best possible base gasoline that is widely available and add to this the maximum usable quantity of anti-knock material of which large quantities can be obtained if necessary. Benzol cannot be used in large proportions because of the danger of ice-formation in the carburetor and even of freezing of the fuel tank and fuel lines. Other aromatics were ruled out by present production limitations. The Division feels that tetra-ethyl lead is the most important available anti-knock material and that the aromatic compounds are the only others worthy of consideration. A first-class California fighting grade gasoline with 3 c.c. tetra-ethyl lead added has been tentatively chosen as a standard, one reason for this being that the anti-knock rating of this gasoline varies less with cylinder temperature than that of other grades.

Cracked gasolines have been little used for aviation so far, because the limit on gum set by the Government specifications are almost impossible to meet with them. However, the Material Division has operated both on air-cooled radial and a water-cooled V-engine on a particular brand of cracked gasoline for many hours without trouble from gum deposits, and Mr. Heron observed that low and stable gum values seem to be obtainable in cracked gasoline.

The Air Corps has tentatively adopted volatility re-

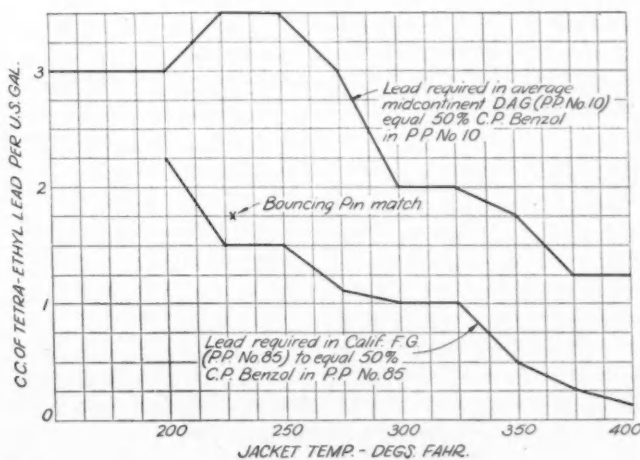


Fig. 2—Tetra-ethyl lead equivalent of 50 per cent chemically pure benzol in two different gasolines as dependent on jacket temperature

quirements for Federal Fighting Grade gasoline, as it has been found that even such volatile fuel requires considerable heating of the intake system for maximum fuel economy. A test with a Curtiss D-12 engine

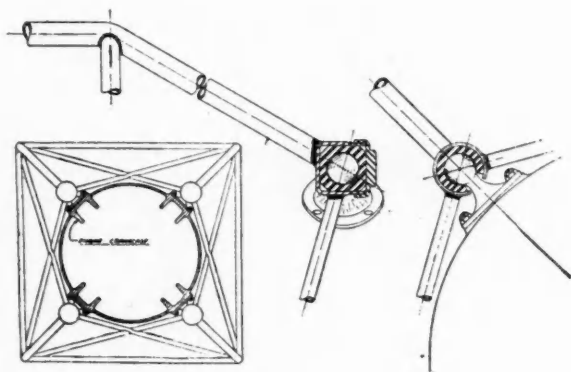


Fig. 3—Four-point engine mount with rubber insulators at points of attachment to crankcase

running on average automobile gasoline showed a loss in power of 10 per cent. Natural (casinghead) gasoline, on the other hand, shows an increase in power, which is thought to be due to higher volumetric efficiency of the engine resulting from the greater cooling effect of the more nearly complete evaporations of this very light fuel.

The recently issued tentative Air Corps specification for Fighting Grade gasoline eliminates the copper disk gum requirement and substitutes an accelerated aging test with oxygen. This test consists in a two-hour treatment with oxygen at 212 deg. Fahr. and 100 lb per sq. in. pressure, followed by evaporation of 100 c.c. in a glass dish, the maximum allowable gum being 15 mg. It is expected that in view of the more rigid anti-knock requirements of the new specifications, some refiners will supply cracked gasoline, and the accelerated aging test was adopted because of the known irreliability of the copper-disk test when applied to other than straight-run gasolines.

Alcohol as Anti-Knock

The available anti-knocks also include alcohol. Owing to its high latent heat of evaporation alcohol has an internal cooling effect and raises the volumetric efficiency, for which reason it is much used in racing engines, particularly air-cooled motorcycle engines. However, only anhydrous alcohol is soluble in gasoline, and even when dissolved picks up water from the atmosphere and is thrown out of solution in consequence. The anti-knock effect is then confined to one layer of the fuel.

Fuel anti-knock values required by aircraft engines vary considerably with compression ratio, volumetric efficiency (affected by supercharging), engine speed, design of cylinder and piston unit and cylinder temperature. The water-cooled Curtiss D-12 was said to be a rather remarkable engine as regards ability to give high output on relatively poor fuel. Air-cooled engines for equal b.m.e.p. require considerably better fuel, as a rule, and the Air Corps has only one air-cooled engine in service that will operate satisfactorily under full throttle at ground level on Mid-Continent D. A. G. It shows only 120 lb. p. sq. in. b.m.e.p. at 1800 r.p.m. as

compared with 138 lb. at 1900 r.p.m. for the Curtiss D-12.

The anti-knock value of the fuel required by any engine can be materially diminished by increasing the fuel consumption over that corresponding to the "best setting" (specific fuel consumption giving 1 per cent less than max. power). In general, the policy of the Air Corps is against such a procedure which, while it produces engines of low specific weight, tends to excessive total fuel consumption and to neglect of cylinder design development.

The Air Corps policy for the future will be to specify a standard fuel and to rate engines in terms of the power they will produce on this fuel at specified maximum fuel consumption at ground level or with an air density at the carburetor air intake equal to that at 5000 ft. altitude, depending on the duty the engine is required for. It is the desire of the Air Corps that maximum cylinder and engine development shall take place around a standard fuel and that engines shall be made to suit fuels rather than fuels to suit engines. The proposed plan of rating engines at a definite allowable fuel consumption is expected to lead to further development of cylinders and to put an end to the rather prevalent practice of cutting engine weight at the expense of fuel consumption.

High Compression Desirable

Mr. Heron also referred to the use of high-boiling point cooling liquids. Nearly all of the work with such liquids in the past has been done at 300 deg. Fahr., he said, but it is likely that the optimum temperature depends on the type of engine and the airplane it is used on. Increase of jacket temperature decreases the possible compression ratio and the degree of supercharging. The highest possible compression ratio is desirable because it improves the fuel economy and reduces the specific heat rejection to the cylinder walls; a high degree of supercharging is desirable because it produces the greatest increase in output on a given fuel, at the

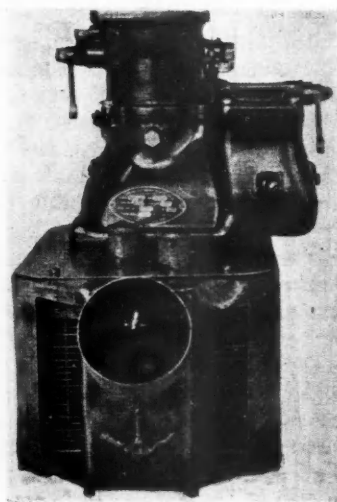


Fig. 4—Oil cooler combined with carburetor air-heater for Wright Whirlwind engine

expense, however, of fuel economy and total heat rejection by the cylinder and piston unit.

In addition to the subjects referred to in the foregoing the paper dealt with corrosion and attack due to fuel in aircraft engines, with vapor lock, lubricating

oil for aircraft engines and carbon removers. Aircraft engines suffer relatively more from corrosion than automobile engines because they generally have steel instead of cast iron cylinder barrels and the valve gears in many engines are not lubricated. The use of doped fuel containing halogens in many cases results in a considerable amount of corrosion, but one of the worst cases of engine corrosion yet experienced by the Material Division occurred with a 2 per cent benzol blend, the benzol containing 0.37 per cent sulphur. Much detailed information on the subject of engine corrosion was given in the paper, and anyone directly interested in this subject should not fail to read the original.

Air-Cooled Radial Engine Installations

ANOTHER paper which met with a hearty response on the part of the audience was on "Installation of Air-Cooled Radial Engines," by P. B. Taylor, acting chief engineer, Wright Aeronautical Corp. Mr. Taylor pointed out that according to Department-of-Commerce statistics, 50 per cent of engine failures are directly chargeable to gas, water and oil-line breakage, which, of course, means faulty installation.

Radial engines are almost universally mounted on a ring having eight to twelve points of attachment to the engine crankcase. This ring is seamed to the ends of the longerons by eight tubes meeting on the vertical and horizontal center lines of the structure. The engine mount is often distorted in welding, and the crankcase, which is accurately machined on the mounting surface, is then called upon to straighten the mount. Mr. Taylor said he failed to see the utility of mounting points not adjacent to the ends of struts to the longerons, as the shear due to engine torque could easily be taken on from bolts.

Shock Absorbing Mounts

The logical engine mount for a radial engine, according to the author, is that shown in Fig. 3, in which eight tubes from the ends of the longerons meet at from equi-distant points on the crankcase, at each of which points a substantial mounting lug is formed on the case. When the engine is not in place the ends of the mounting structure may be tied together by light tubing. Mr. Taylor stated that the crankcase is far more rigid than a tubular ring and can be readily made adequate to withstand the mounting strains. Automobile manufacturers have been forced to adopt rubber mountings for their engines, and since aircraft engines vibrate far more than automobile engines the public will certainly demand shock-absorbing mounts (Fig. 3) once it realizes their effectiveness.

During the past two years, front and rear exhaust collector rings have been substituted for the open stacks formerly used in connection with radial engines, which had the disadvantage that the exhaust was annoying to the pilot and often impaired his vision at night. A front exhaust collector is lighter than a rear one, being smaller in diameter and it has the further advantage of allowing the engine manufacturer to finish his part of the cowl in front of the engine. The author gave it as his opinion that the engine manufacturer should complete the engine cowl and establish a ring behind the engine to which the cowl of the ship attaches. If the dimension were once established new ships would be designed to conform to it.

Nose-cowl shutter are in vogue at present. Most of these are adjustable from the pilot's seat, but Mr. Taylor seemed to favor adjustment merely for seasonal changes, from the ground, as cylinder barrel temperatures of from 100 to 300 deg. Fahr. are satisfactory, which eliminates the need for close and frequent adjustment; the pilot already has many controls to attend to, and the guide he has in making the adjustment is the oil temperature, which is only remotely related to the barrel temperature. The ordinary engine cowl has little effect on drag, its principal object being to control the cylinder temperature. This is often overlooked by plane manufacturers who fail to provide louvers in the cowl behind the engine, without which the louvers in the nose cowl are ineffective.

Spinners Have Favorable Effect

Spinners on propeller hubs were discarded several years ago because they were found to have little effect on drag and would not stay on. They have a favorable effect on engine cooling, however, because they mask the round section of the propeller which throws the air in a radial direction away from the louvers in the nose cowl, and Mr. Taylor expressed the hope that if spinners should return they would be provided with a continuous, substantial ring at their trailing edge.

Townend rings, the author said, give promise of distinct advantages over the N.A.C.A. cowl in all respects except appearance, and can be fitted over practically all conventional cowls regardless of exhaust system. Their cooling characteristics in most cases are better than those of the conventional cowl without ring.

It is suspected that uncooled exhaust manifolds are largely responsible for fires following minor crashes. The British Air Service has set a maximum value for the exhaust manifold temperature which is well below the flash-point of gasoline, and the author suggested similar action on the part of our Department of Commerce provided investigation should show the assumption to be correct.

Accessibility of engine accessories and oil connections must be constantly kept in view when designing the exhaust manifold and cowl. N.A.C.A. and Townend rings usually present a difficult accessibility problem. A segmental Townend ring attached to the cyl-

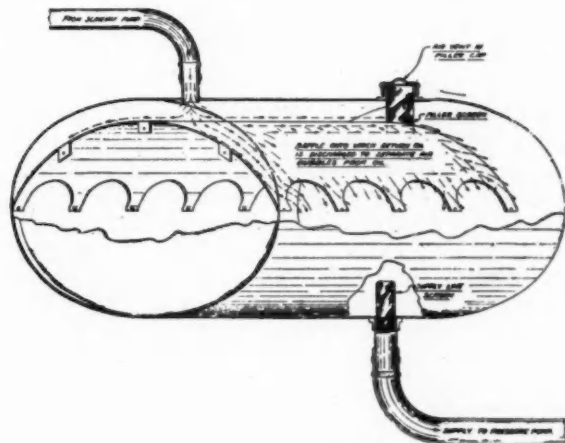


Fig. 5—Oil tank designed to prevent the formation of foam

inder heads under the rocker-box cover is suggested. In this case the rocker-box covers should be made angular to conform with the circumference on the ring. This permits the removal of rocker-box covers for

servicing without disturbing the cowl. N.A.-C.A. cowls should be made removable in halves secured by quick detachable fasteners.

Carburetor air heaters and air cleaners often increase difficulties of installation and are unsightly. The author favors what he calls a banjo-type air heater which obtains sufficient heat from the exhaust manifold or open stacks to prevent ice formation in the carburetor and renders a hot-spot beyond the carburetor unnecessary. If an unusual amount of heat is required it can be obtained by fitting a larger shield under the exhaust manifold. Thus forcing the intake air over a larger exhaust-pipe surface. The heater contains an air-maze screen-type air cleaner which is impregnated with oil.

In discussing the lubrication system, the author emphasized the great importance of the pump suction line from the standpoint of general reliability. It must be of sufficient diameter to offer no great resistance to flow; the pressure pump should always be below the level of the oil in the tank so as to be self-priming, and a reservoir should be left below the tank suction line to collect dirt in the oil. The line must be absolutely tight, and must be protected against extreme cold by lagging it with tape or asbestos cord and placing it inside the cowl.

The author said it would astonish pilots to be told that the oil returning from the sump is frequently at from 250 to 300 deg. Fahr., since they generally considered 190 deg. dangerous. The reason for the difference between the temperatures of oil returning from cylinder walls and that of oil in the tank (which is the temperature indicated) is that cold oil from the pressure relief valve mixes with hot oil from the engine, thus depressing the temperature in the tank. The author's company at one time connected an oil thermometer directly to the crankcase, but was compelled to remove it again, because pilots were accustomed to the lower temperatures of the oil in the tank and refused to fly the engines.

Oil Coolers Disappoint

Oil coolers often are a disappointment to the designer as regards their effectiveness. They usually consist of a number of tubes in parallel; all cannot be expected to pass oil at the same rate; the cooling effect will be greatest where the oil flows at the lowest speed, and this oil will increase most in viscosity, which will further reduce the rate of flow and of heat abstraction. Moreover, in the oil tank the oil is cooled at the surface to which it adheres, forming a heat-insulating layer.

Oil coolers have long been the bugbear of the plane manufacturer, who can hardly be expected to take kindly to the idea of hanging such a device in the slipstream after he has spent much time and thought cleaning up the plane. But most large engines need oil coolers. An oil cooler combined with the carburetor air-intake has recently been developed and is shown in Fig. 4. By this method the oil can be quickly warmed at starting when the cold-air doors on the heater are closed and warm air from the manifold passes over the coolers. As the oil temperature rises the pilot "cracks" the cold-air doors for the control of oil tem-

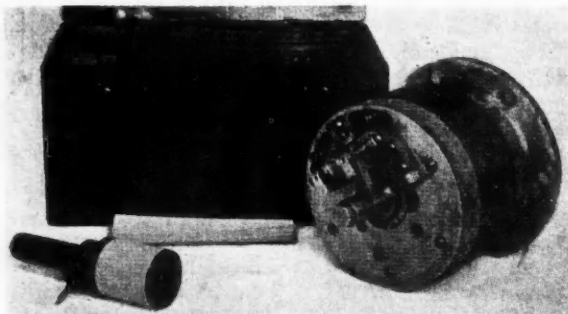


Fig. 6—Prescott torsigraph

perature, and the same control gives the proper temperature to the intake air, since when the oil is cold the engine requires hot air to the carburetor, and when it is hot the carburetor can be operated on colder air.

The author also explained the phenomenon of foaming in the oil tank which results in a drop of oil pressure that often alarms pilots. The cause of foaming is the

difference in pumping capacity of the scavenging pump and the pressure pump. The former is always made of larger capacity, to prevent an accumulation of oil in the sump. Since the scavenging pump can move only as much oil as is delivered by the pressure pump, the rest of its capacity is taken up in moving air, which it delivers to the tank. This air becomes intimately mixed with the oil in the form of minute bubbles. An additional quantity of bubbles may be formed in the system by the return oil splashing into the volume of oil in the tank. This action can be observed when running a swift stream of water into the bathtub. Under favorable conditions, a large proportion of the water in the tub will contain small bubbles. The effect of these small bubbles in the oil is to reduce the oil pressure. Oil foaming will occur more readily under the following conditions: (1) hot oil, (2) small quantity in tank, (3) short oil return line, (4) engine having numerous scavenge pumps and a small sump, and (5) high narrow oil tank.

Combating Foam

The question of how to prevent this pressure drop next arises. An effective method is to discharge the oil on a plate sloping into the oil volume, and allow it to run down the sides into the oil in the tank. Fig. 5 shows a suitable oil baffle for foam elimination.

The author also discussed the fuel system and pointed out that fuel lines should be braced at frequent intervals to prevent vibration and failure. Each installation is a special study, requiring experienced engineering, and is not a job for the mechanic alone.

Harold Caminez, engineer-in-charge, Aircraft Engine Department, Allison Engineering Company, discussed the trend in aircraft engine development in a general way. He placed particular emphasis on the need for ability to cool properly under conditions of fuel throttle and low air speed (as in rapid climb) and for the ability to regulate the cooling effect in planes having a wide speed range, and the discussion which followed the reading of his paper centered largely around the question of air-cooling vs. liquid-cooling.

Ford L. Prescott, senior mechanical engineer, Material Division, Air Corps, Wright Field, read a paper on "Vibration Characteristics of Aircraft-Engine Crankshafts." Mr. Prescott has developed an instrument, Fig. 6, which makes a time-displacement record of torsional vibrations in crankshafts. It makes use of a flexible cable of small size, pulleys and a drum on the shaft carrying the pencil. The cable eventually wears out but has a life of several hours of continuous indication, and, besides, it is easily replaced.

The record is made on ordinary indicator paper. A drum is provided which retains the paper, and since the pencil revolves with the instrument, the drum is

held in the hand, inserted over the pilot provided for it, and quickly pressed in and withdrawn. The last $1/32$ inch of motion of the drum operates a bell-crank system and presses the pencil against the paper. A pointer is provided on the drum, and with the engine set on top center of one cylinder, the beginning of the card is lined up with the pencil, the pointer being vertical. This serves to locate the crank positions on the records. The two revolutions in the engine cycle are superposed, hence the complete cycle crosses the card twice before it repeats. In the present design, the records show a displacement of $1/8$ inch for each 1 deg. of torsional displacement of the crankshaft. The natural frequency of the spring-driven flywheel is 10 to 12 vibrations per second. This frequency is necessitated by the high accelerations to which aircraft engines are subjected.

Frequency of Torsional Vibration

Mr. Prescott showed records taken with this instrument on numerous engines, and explained their significance. He also explained a method of predetermining the frequency of torsional vibration of crankshafts, based upon the principles laid down by Professor Fimoshenko in his book on "Vibration Problems in Engineering." By this method the various masses are considered centralized at the center of symmetry of the crankshaft. Slightly different results are obtained according to whether the crankshaft is considered constrained or unconstrained. Frequencies were calculated for seven different crankshafts calculated under both suppositions, as well as by a method described by B. C. Carter in *Engineering* of July 13, 1928, and the results were compared with the actually observed frequencies. Mr. Prescott said that it is now possible to predetermine the frequency of torsional vibration of crankshafts by calculation to within 5 per cent. The amplitude of vibration also can be calculated, but the limit of accuracy is lower, the result being correct only within about 25 per cent.

The discussion brought out that some of the minor periods of crankshafts can be almost eliminated by changing the firing order, and that this is a factor on which the amplitude of the vibration depends.

One session was devoted to the subject of light alloys in aircraft construction, papers being presented by Dr. H. W. Gillett, director, Battelle Memorial Institute, Columbus, Ohio ("Some Characteristics of Light Alloys for Aeronautics"), and by Lieut. A. J. Lyon, Air Corps, Wright Field ("Aluminum Alloys for Pistons and Air-Cooled Cylinder Heads"). Dr. Gillett, after discussing aluminum, magnesium and leyllium, and calling attention particularly to their various drawbacks, said: "Competition among light alloys and with other alloys will go on. Every time a drawback is overcome, whether it be of price, of fabricability or of properties, the im-

proved material will find wider use in aircraft. The survival of the fittest materials will doubtless bring light alloys even more to the fore in aircraft construction. Without them aircraft could not have reached their present usefulness. Aeronautics owes much to the science of aerodynamics and to engine designers, but it also owes much to metallurgy."

H. L. Dryden, chief of the Aerodynamical Physics Section of the Bureau of Standards, spoke on "Silencing the Airplane." This, he said, is a very important problem but one which presents many difficulties. The chief sources of noise are the engine exhaust and the propeller, and not much could be gained by thoroughly muffling the exhaust, for instance, if the propeller noise remained. Work on two phases of the problem—engine exhaust muffling and noise-proofing of airplane cabins—has been carried on at the Bureau of Standards.

Experiments with propellers showed that at a certain tip speed, somewhere between the velocity of sound in the air and 0.7 times that velocity, the flow of air over the blade surfaces changes from a smooth to a burbling flow, which change is accompanied by a great increase in noise. In fact, as the tip speed approaches the velocity of sound, the noise becomes an unbearable din. The only conclusion that can be drawn is that the tip speed should be kept as low as possible.

Three Muffling Principles

Mr. Dryden said there are two well-recognized and effective principles on which mufflers may be operated, and a third principle is sometimes suggested but is less effective than the other two. The first principle, mostly employed in automobile mufflers, consists in inserting resistance in the exhaust line so that pressure pulsations and noise are reduced. Most of the successful airplane mufflers (if any can be said to be successful) operate by reducing the speed of discharge of the exhaust gases. In practice the muffler utilizes some form of expansion chamber which serves to damp pressure fluctuations to some extent, but it is more important to cool the exhaust gases rapidly. In some designs the cooling is facilitated by providing devices to introduce a considerable amount of air, which is mixed with the exhaust gases.

The third principle often advocated is to apply the methods of sound interference. In the laboratory, with pure tones it is sometimes possible to divide the sound path and produce at some specified location a low level of intensity, but with complex sounds (noises) the method of interference gives very unsatisfactory results in the laboratory.

An airplane cabin cannot be rendered silent by merely increasing the resistance of its walls to the transmission of sound; there must also be means for the absorption of noise within the cabin, for without such absorption the noise eventually becomes as great within as without. The prospects of se-

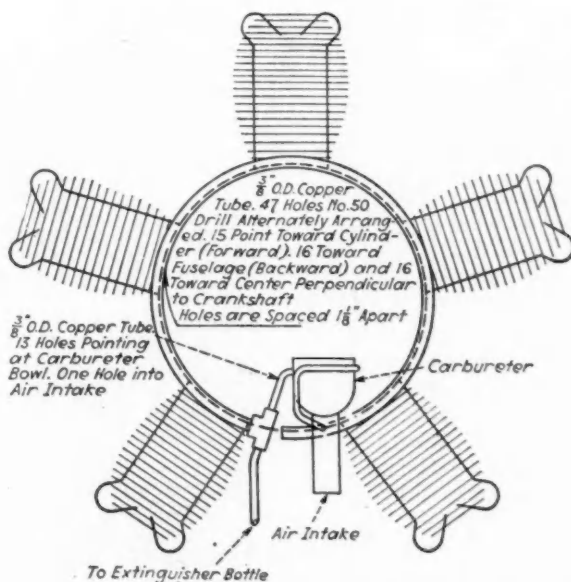


Fig. 7—Method of installing fire extinguisher manifold on radial air-cooled engine

curing a satisfactory reduction of loudness by simple sheets of a single material in the walls of the cabin are not very bright, and Messrs. Chrysler and Snyder, who worked on the problem at the Bureau of Standards, therefore turned their attention to composite materials. With light materials, such as sheets of aluminum, the transmission through two sheets separated by an air space was greater than through a single sheet. Test showed that the use of absorbent material between the panels was very effective.

Commander C. G. McCord, Superintendent of Tests, Naval Aircraft Factory, Philadelphia, presented a paper on "Fire Prevention Problems." Most fires in conventional airplanes occur in the engine compartment, and the main reliance is placed on apparatus designed to reach that space, probable equipment usually being provided to take care of the other parts of the plane, Commander McCord said. To prevent trouble from carburetor back-fires the air-intakes may be screened (which will cause a reduction in brake horsepower of as high as 4 per cent), the Davy safety-lamp principle and triple screens being used. But whether screened or not, the air-intake should be led well outside the engine cowling. This is not always simple in a seaplane, where spray may strike the air horn, but no deviation should be made from the rule.

The running engine may serve to blow out the fire or to impact the fire-extinguishing medium against the fire, which chances offset the argument that it fans the fire. Unless wood or some similar substance which burns without definitely volatilizing is present, the

strong draft is a cure for rather than an aid to combustion.

The illustration (Fig. 7) reproduced from Commander McCord's paper shows the installation of a fire-extinguisher manifold for extinguishing carburetor and similar fires on a radial air-cooled engine. The paper also dealt with the various fire-extinguishing media in use, methods of operation of the extinguishers and tests made by the Navy of fuel lines and of fuel tanks.

Roy V. Wright, managing editor of *Railway Age*, New York, spoke on "What can Aviation do for Central and South America?" He gave much information in tabular form on the population and various means of communication of the Central and South American countries, and quoted figures gathered by the Aeronautic Trade Division of the U. S. Department of Commerce showing that on Feb. 15, 1930, there were 37,530 miles of air lines in and between the countries and colonies of the Western Hemisphere south of the United States. This compares with 10,000 miles at the end of 1928, less than 14 months earlier. Department of Commerce figures as of Feb. 15, 1930, show the scheduled airways operating in the United States to be 36,982 miles, or somewhat less than in Latin America at the same date. Mr. Wright said our neighbors to the south will require capital to build airways and to provide the necessary facilities and equipment; as yet they have not developed industrially to any great extent, and they will have to look abroad for equipment and (in some cases at least) for technical services.

Marquette Company Press Equipment

EXTENDING the application of Marquette pneumatic and hydro-pneumatic die cushions, originally designed as an adjunct to standard press equipment, the Marquette Tool & Mfg. Co., Chicago, Ill., enters the field of complete press equipment with the introduction of three new machines, equipped with built-in pneumatic die cushions.

The first of the units, a new press bed with a self-contained pneumatic die cushion provides economy in space and makes it unnecessary to provide a pit or special foundation. It is available for any size or make of press, or may be built to meet special requirements of size and capacity.

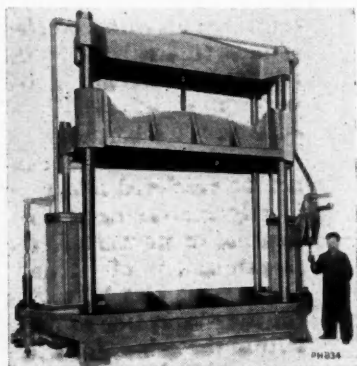


Fig. 1 — Die-spotting machine offered by Marquette

To facilitate die spotting, Marquette offers their new die spotting machine (Fig. 1). Here the movement of the slide or ram is effected by compressed air from the shop air supply. The bed and rams are held in perfect

alignment by four guide rods, the ram being adjustable for any desired speed, fast or slow.

This machine is available in a number of sizes ranging from a bench size to 100-ton capacity.

The third machine (Fig. 2) is their new riveting machine equipped with a hydro-pneumatic die cushion which automatically allows for variations in thickness of the parts. It is designed to fully expand and perfectly head rivets under ordinary operating conditions. Where desired it is possible to provide a special means for cutting out the cushion at will, thus making the press available for punching, forming and other types of press work.

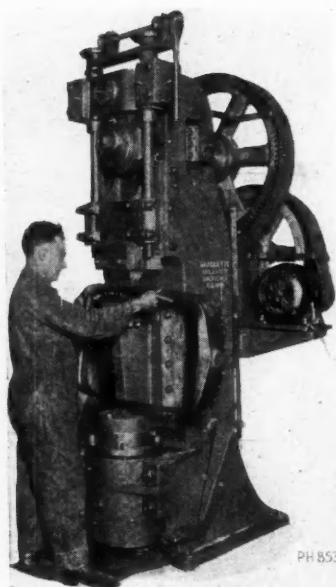


Fig. 2—Marquette riveting machine

Railroads Aid Competitive Bus

Pennsylvania uses motor vehicle
as a means of protest against
proposed cut in rail tariffs.

AN event of great potential significance to bus and truck companies occurred when the Baltimore & Ohio Railroad announced a cut in special rail-

road coach rates between New York and Washington.

The Baltimore & Ohio proposed special one-way coach fares of \$5.50 between New York and Washington, a reduction of \$2.64 or 32.4 per cent under the standard carload day-coach rates between these points. Corresponding reductions were also proposed to be made between New York and Baltimore, Md.; Philadelphia and Baltimore; Philadelphia and Washington, and Philadelphia and Pittsburgh, all of which were substantial reductions under the standard railroad day-coach fares.

These representative rates average about a third under the normal railroad coach fares. The passengers using these special fares were to be restricted to the use of certain trains only.

The proposed fares were filed with the Interstate Commerce Commission to become effective April 20, 1930. Prior to that date the tariffs were suspended upon protest filed by the Pennsylvania, and the Interstate Commerce Commission was asked to investigate the legality of the cut rates.

In its protest, the Pennsylvania Railroad challenged the legality of the proposed reduced fares upon the ground that the reductions were made in order to enable the Baltimore & Ohio Railroad to compete with the motor bus service operated between the cities in question by the Greyhound Lines, Inc., and motor bus companies in which the Pennsylvania has interests or with which the railroad is affiliated.

The Pennsylvania Railroad established coordinated railroad motor bus service between New York and Chicago; New York and St. Louis; Philadelphia and Chicago and Philadelphia and St. Louis, as well as motor bus service between New York, Philadelphia, Baltimore and Washington. The coordinated rail-bus services were withdrawn on April 14, 1930.

The objections of the Pennsylvania Railroad to the proposed fare reductions were based upon several fundamental considerations:

1. The proposed fares went far beyond the

By LLOYD H. WILSON

Professor of Commerce and Transportation
University of Pennsylvania

mere meeting of the coordinated motor-rail passenger services and undertook to compete with the motor bus service by reducing railroad fares, and

2. The proposed reduced fares would break down the established bases of through passenger fares and cause other railroads to make corresponding fare reductions in order to preserve their competitive relationships, and
3. The reduced railroad fares would force the direct rate competition of railroads with bus lines to the unfair prejudice of the latter due to the faster time by railroad, and
4. The reductions would lead to rate wars between railroads and motor bus operators, since bus operators probably would not tamely submit to the fare reductions without making corresponding reductions in the motor bus rates to preserve the differential relationship between railroad and motor bus passenger fares.

The immediate result of the protest was the withdrawal of the Baltimore & Ohio Railroad's proposed reduced rates before they were to have become effective.

What does it mean?

The real results of this clash of interests is of great significance to the transportation world. One railroad establishes a comprehensive system of rail-and-bus passenger service at rates lower than the all-rail fares, and acquires interests or becomes affiliated with motor bus companies providing service at rates materially lower than the standard passenger rates. Another rail carrier seeks to meet the competition of reduced rail-and-bus or bus fares by reducing the passenger fares on certain trains. The rail line having the motor passenger lines protests against the reduction in all-rail fares—and the reduced rail fares are withdrawn

and the coordinated rail-motor passenger arrangements are withdrawn.

Economic conditions make strange bed-fellows. In the protest of the Pennsylvania Railroad to the Interstate Commerce Commission we see the statement that would have sounded strange in the ears of motor carriers a few years ago—a strong statement of a railroad com-

Bus Future Assured

"THE bus has won its place in the transportation field."

An expanding market for buses is assured by the coordination of rail and motor coach services by the trunk line railroads.

Special and Standard Rail Fares Compared

Between	and	Standard All-Rail Fare	Special Railroad Coach Fares	Percentage Reduction
New York	Washington	\$8.14	\$5.50	32.4
New York	Baltimore	6.70	4.50	30.4
Philadelphia	Washington	4.90	3.50	33.4
Philadelphia	Baltimore	3.46	2.50	27.9
Philadelphia	Pittsburgh	12.58	8.00	36.4
Baltimore	Pittsburgh	10.90	7.00	35.8
Washington	Pittsburgh	10.90	7.00	35.8

pany defending the motor bus and stressing its economic usefulness in certain fields of transportation. The statement is quoted verbatim:

"From such contact as your protestant (The Pennsylvania Railroad) has had with bus operators, it is able to state as a definitely established fact that rail service from an economic point of view cannot hope to compete with bus operations in the field where the latter have their chief business. Bus operation is today a great industry of growing power and effectiveness in which numerous sums of money are already invested, and in the opinion of protestant, this form of transportation must be accepted as established. Any attempt on the part of rail lines seriously to compete with this form of transportation in its particular field is unwise economically and can only serve to undermine the rate structure for the more suitable transportation service which the rail carriers can and will continue to render."

What may this mean?

The final results of the competition of railroad and motor coach competition and coordination are obscured in the mists of the future. A few straws blown by the winds of controversy and agreement appear to indicate certain fundamental facts and trends.

1. The motor industry has little to fear from present indications that the market for motor buses will be curtailed. The motor bus has won its way to a definite place in urban, interurban and certain phases of long distance transportation.
2. The rail buses which have established motor-rail coordinated services will probably continue to constitute an expanding market for buses.
3. The public wishes transportation services at lower rates than available by rail routes and will continue to use bus service so long as lower rates are available by motor coach.
4. The railroads of the United States are well aware that motor bus is an established institution and that the public will patronize lower priced transportation services when they are available.

Significant Developments

It is the opinion of this writer that two developments of great significance in passenger transportation are ahead of us in the United States, each of great moment for the railroads, the automotive industry and the public. There appear to be valid reasons to believe that the railroad companies of the present are going through a period of metamorphosis which will change them from the "railroad caterpillar" to a "transportation butterfly" interested not only in the operation of railroads, but steamship, motor and air transportation services, through coordinated rail-motor, rail-steamship and rail-air transportation services. These coordinated services may be performed by

absorbing other types of carriers into the present railroad systems, by consolidations or mergers, by subsidiary company operations, or by through route and joint rate arrangements with other types of carriers.

Another significant change which appears to be impending is the development of a comprehensive classified system of passenger services with rates made according to the quality of the service. A standard service, a superior service with seat reservations and other luxuries, and one or more inferior or sub-standard services at reduced fares, appear to be in the period of formulation.

Contrary to a widespread popular notion that Americans do not like class distinctions and, therefore, would not patronize transportation services where these distinctions were made, there is ample evidence that the traveling public will patronize lower priced passenger services. The crowds attracted to low-rate railroad excursion trains and the volume of motor bus travel attest this fact.

New-Way Industrial Engines

THE New-Way Motor Company, Lansing, Mich., has brought out 3 hp. and 4 hp. industrial engines of the air-cooled type. These engines have cylinders of the L-head type, of 3½-in. bore and 4-in. stroke. Both engines have the same cylinder dimensions, the 4 hp. being operated at higher speed than the 3 hp.

Both the pistons and connecting rods are of aluminum alloy. A Tillotson carburetor is used, and a special 8 in. Bosch flywheel magneto. Timken roller bearings are used on the crankshaft, while the camshaft is mounted in Hyatt roller bearings and is driven by a Diamond single chain.

The engine has a cast-iron detachable cylinder head in which the spark plug is located over the inlet valve. Lubrication is by circulation splash, a plunger pump bolted to the outside of the crankcase and actuated by one of the valve cams, sucks oil through a screen and delivers it to the connecting rod splash pan. The cooling system consists of a Sirroco-type fan cast in the flywheel which draws air through the front screen and blows it across the cylinder block which is provided with horizontal fins. The engine is controlled by a so-called air governor in the inlet passage which is said to maintain the engine speed within 5 or 10 per cent between no load and full load.

BULLETIN No. 206 of the Engineering Experiment Station of the University of Illinois, entitled "Studies in the Electrodeposition of Metals" (by Donald B. Keyes and Sherlock Swann, Jr.), gives a history of the deposition of the more uncommon metals and describes experiments made by the authors.



One of the new 4-ton Fisher Standard Super-sizes, with rack body and sleeper cab. It is powered with a six-cylinder, 102 hp. Continental valve-in-head engine

Standard Offers New Truck Line

Series covers entire field from $\frac{3}{4}$ -ton to five tons and over, with four and six-cylinder powerplants

A COMPLETE new line of trucks, covering the entire field from $\frac{3}{4}$ -ton to five tons and over—all carrying the name "Fisher Standard"—is announced by the Standard Motor Truck Co. Along with the presentation of this new line, Standard also announces that it has now available a dealer financing plan, including a 60-day floor plan.

Of the former lines of trucks only the Merchants Express series is retained. Outstanding features of the new line include more attractive lines throughout, with deeper radiators, better looking cabs, adoption of cowls, curved spring horns on the front end of frame side rails, etc. Gross rating in a modified form has been adopted for the new Fisher Standard Trucks, as shown by the accompanying summary of major specifications.

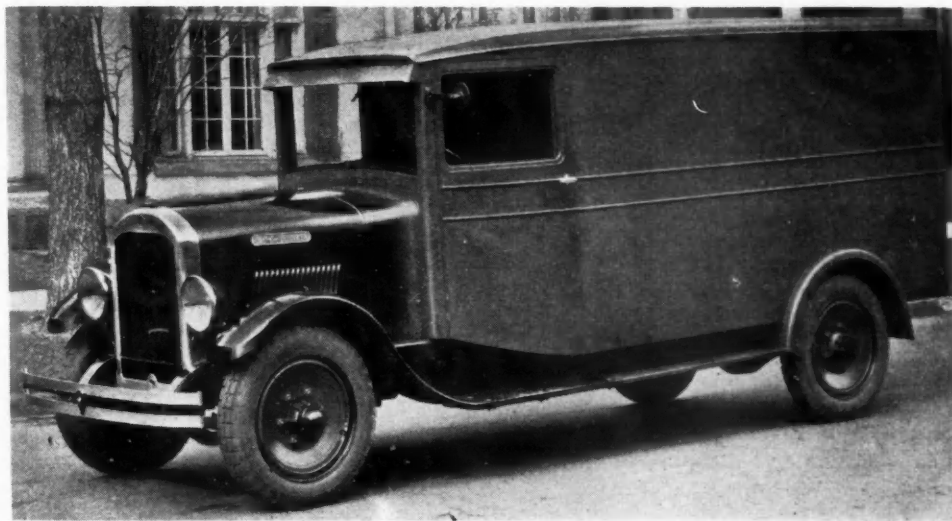
Models carrying four-cylinder and others carrying six-cylinder engines, in the new line, are available in the $\frac{3}{4}$ -ton, $1\frac{1}{2}$ -ton and 2-ton classes, all engines being of Continental manufacture. From the $2\frac{1}{2}$ -ton range upward, and including this range, the new trucks are powered by the recently developed Continental valve-in-head truck engines. All models below $3\frac{1}{2}$ tons, or 20,000 lb. gross rating, have four-speed transmissions. From $3\frac{1}{2}$ -tons up, seven-speed Brown-Lipe units are used, together with multiple-disk clutches. The latter

are also used on the $2\frac{1}{2}$ and 3-ton models, with single-plate Brown-Lipe units on the smaller.

Unit mounting of powerplant has been selected for all models up to and including the two-ton, above which transmissions are mounted amidships, with four universal joints.

Two, $2\frac{1}{2}$, 3 and $3\frac{1}{2}$ to 4-ton models are available in either bevel or worm final reduction. The five-ton model comes only with a worm-drive axle. Hotchkiss drive is provided for on the models ranging up to $1\frac{1}{2}$ tons in capacity. Above this radius rods are used to take the propulsion.

A feature is found in the equipping of all models with internal Lockheed four-wheel hydraulic brakes.



Panel delivery on the new $1\frac{1}{2}$ -ton Fisher Standard truck, showing the new deeper radiator, cowl, improved body lines, and curved front spring horns

Just Among Ourselves

Merchandising on Worth Starts Abroad in Earnest

AMERICAN automobile exports are large because we have been able, thus far, to provide most foreign markets with the vehicles best suited to their purposes at the lowest price. Patriotic appeals generally have failed to stay the sale of our automobiles abroad to any marked extent. But our foreign manufacturing competitors are trying vigorously to prove worth, as well as patriotism, as a reason for buying in their own countries and colonies.

A tour has just been completed in New Zealand, for instance, "to demonstrate the suitability and value of motor vehicles manufactured in Great Britain for use in New Zealand." It began at Wellington on March 24, and ended at the Town Hall, Wellington, on April 2. April issue of *The Radiator*, official publication of the New Zealand Motor Trade Association, carries an interesting story of the tour.

Vehicles participating included: Cars—Wolseley, Morris, Austin, Humber, Hillman, Vauxhall, Armstrong, Siddeley, Jowett, Sunbeam, Talbot and Standard. . . . Trucks—Morris, Leyland, Guy and Thornycroft.

* * *

New Zealand Recommends Harry Tipper's Writings

AND on another page of the same issue of *The Radiator* we found fifteen or twenty paragraphs telling of the visit to New Zealand of Harry Tipper, general sales manager, General Motors Export Corp. Aside from his automotive prominence, the magazine points out that Mr. Tipper is well known in New Zealand as the author of "several books on business subjects which have reached a large audience." It then mentions several of Mr. Tipper's books, including "The Human Factors in Industry," which,

by the way, warrants rereading every year or so.

Mr. Tipper, we understand, is due back in New York on June 9.

* * *

Chrysler Joins Movement for Open Bargain Sales

CHRYSLER has joined the ranks of car manufacturers who go in for open bargain sales on lines about to be superseded by new models. Which causes us to repeat the belief that this frank method of handling clean-ups is superior to the inside trading allowance plan often followed. The "price-reduction-pending-new-lines" policy is utilized successfully by almost every other merchandising industry and it does not give the car owner an additionally inflated idea of the value of his used car as does the inside trading allowance policy.

Chrysler definitely states in its announcements that the reduction applies only to the "77" model and that other current Chrysler models are being continued unchanged.

* * *

Wane of Two-Door Sedan Shows in Body Trends

BODY types come and go. The reasons for their waxings and wanings usually are easy to rationalize after the fact; figuring them out ahead of time is both more difficult and more profitable. The closed car, of course, has long since won dominance as the major body type. But there are many different kinds of closed jobs.

Take, for instance, the Victoria model, which was included in many passenger car lines a few years ago. Today only one or two makers build Victorias. Personally, we have wondered a little at the almost complete eclipse of this particular model. It is the only model which combines the ability to carry four passengers under cover and at the same time permits the body de-

signer to get the grace and snap in appearance usually inherent in the coupe as compared to the full sedan. By Victoria we mean a closed car, with the seat beside the driver folding under the dash and narrow seating with small leg room for two passengers in the rear.

Maybe the present trend away from two to four-door sedans will result in a recrudescence of something resembling the Victoria model for such owners as only occasionally want to carry four. The rumble seat in either the roadster or the convertible coupe never will fill the needs of all owners of this particular class.

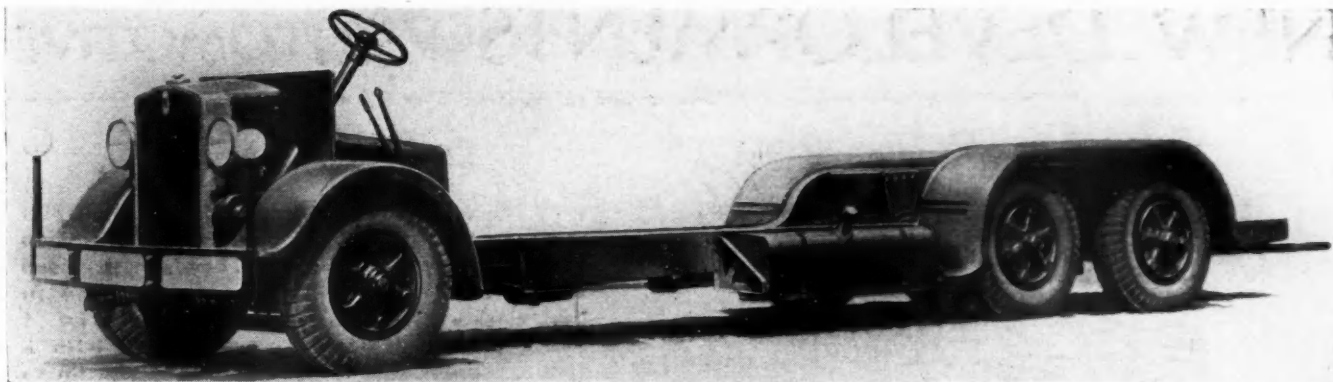
Decreased production costs on four-door sedans have combined with public preference, it would seem, to make for the waning in prominence of the two-door type. Several lines already are without a two-door sedan model, while several more eliminations seem likely to be noted in 1931.

* * *

New Car Announcements Coming Later This Year

TALKING about 1931 model announcements, there seems to be a general shifting of announcements to slightly later dates. Back in 1928 about six per cent of all the new model announcements made during the year came in June; about 12 per cent in July. Last year, not a single new model announcement was made in June, while July accounted for only five per cent of the total. It's too early to figure percentages this year, of course, but it is already certain that few if any models will make their appearance in June.

The whole effect of this year of readjustment, as a matter of fact, seems to be toward decreasing rather than increasing the total number of new model announcements to be made. It will be interesting to examine the final figures on this at the end of the year.—N.G.S.

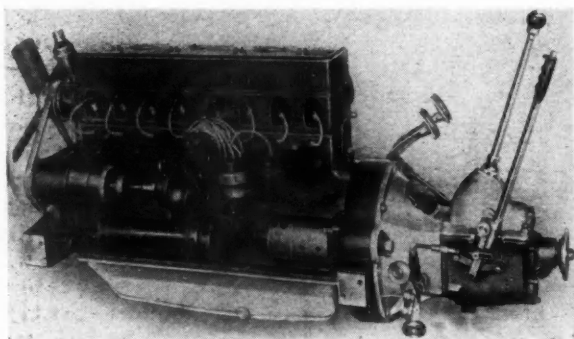


Chassis of the Fiat 6-wheel 100-passenger bus shown at the Milan Samples Fair. This is said to be the first six-wheel automobile to be built in Italy

100-Passenger Bus at Milan Show

By W. F. BRADLEY

ASIX-CYLINDER, six-wheel, 100-passenger bus built by the Fiat Company was one of the outstanding features of the Italian automobile show forming part of the annual Milan Samples Fair. This apparently is the first six-wheel automobile to be built in Italy, and it emphasizes the growing tendency in Italian cities to substitute gasoline vehicles for electric street cars.



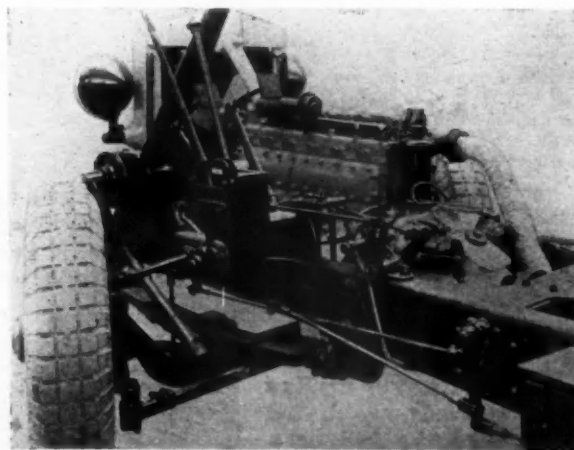
Powerplant of Fiat six-wheel bus

The Fiat bus has a six-cylinder L-head engine of 4.13 by 5.31 in. bore and stroke, and is held down by a governor to 2200 r.p.m., at which speed it develops 90 hp. With cylinders in one casting, mounted on a cast iron base chamber, it has a seven-bearing crankshaft and is distinctive by the use of double ignition, with the two spark plugs mounted vertically in the head, and by the use of both a scavenging and high-pressure pump for lubrication to the main and connecting rod bearings. There are two electric starters working in tandem and mounted to left and right of the clutch housing.

The engine has rollers under the rear of the crankcase, these engaging with the engine sub-frame and enabling the entire engine, together with the radiator, to be pulled forward for easy removal from the chassis.

Other Italian makers are now giving additional attention to trucks and buses. Ansaldo is on the market with two types, one a 2-tonner with a four-cylinder engine and the other a 5-tonner with a six-cylinder engine. O. M. is working together with the Swiss Saurer company and is marketing that firm's trucks and buses in Italy. Lancia has for several years given as much attention to bus and truck chassis as to private cars.

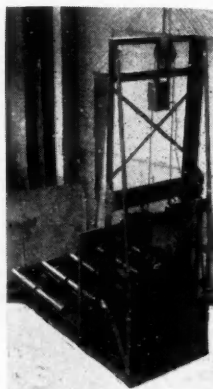
The only new passenger car models were two AnsalDOS, one with an overhead-valve straight-eight engine of 2.95 by 3.94 in. cylinder dimensions, the other with an overhead camshaft six-cylinder engine of 2.95 by 4.04 in.



Eight-cylinder overhead valve of the Ansaldo passenger car

NEW DEVELOPMENTS—AUTOMOTIVE

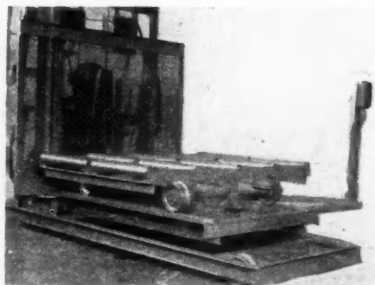
Revolvator Portable Elevator Installation



AN interesting installation of a Portelator (portable elevator) has been built by the Revolvator Co., Jersey City, N. J., for a large automobile manufacturer located at Columbus, Ohio. Specifications were particularly exacting as they required the transfer of automobile bodies from several lines of continuous conveyors 27 in. high, on the ground floor, to a balcony, and then a final haul to the assembly

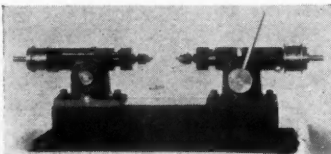
conveyors, 16 in. high.

This Portelator, which has a large platform equipped with tracks, was arranged to be pushed by hand on tracks, and carries a roller top transfer car. Elevating and lowering is effected by motor drive, with push-button control at the station on the platform. Phase, overload, and slack cable protective features, including interlocking electrical connection and mechanical lock to hold the transfer car on the platform, are all provided. Added safety features include a safety device for holding the platform in position in event of a broken or slack cable, and brakes on the front wheels.



Langelier Bench-Type Duplex Driller

SIMULTANEOUS drilling or countersinking ends of rods, shafts and similar work, with a capacity up to $\frac{3}{8}$ -in. drill size, is provided by the new bench-type duplex drilling machine just announced by the Langelier Mfg. Co., Providence, R. I. The drilling heads are bolted to the bed in a fixed position to suit the length of



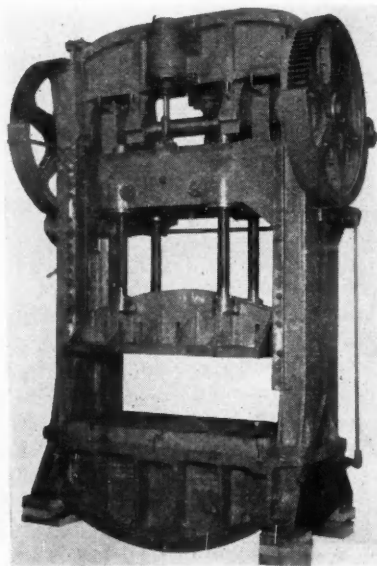
work for which they are intended. Drilling spindles are heat-treated and ground, and run in phosphor bronze bearings. They are provided with ball thrust bearings and are mounted in feed sleeves having a maximum feed range of 3 in., each feed sleeve being provided with a drilling stop. These spindles can be run up to a maximum speed of 6000 r.p.m. and are fitted with No. 1A or No. 2A Jacob Chucks. The drilling feed is operated by a hand lever on the right-hand head, feeds for both drilling heads being interconnected by levers and a connecting lock at the rear of the machine.

This machine is made in several modified forms, some being mounted on a table and legs with motor drive for each head from underneath while others are arranged with an automatic feed release in the right-hand head when holes have to be drilled through the entire length of the work. The machine requires a bench space of 36 in. by 10 in.; its weight is approximately 200 lb.

Bliss Double Crank Press With Slide Adjustment

THE demand for flexibility in job shop operation is said to be met by the new double crank press No. 8E with four screw slide adjustment, recently added by E. W. Bliss Co., Brooklyn, N. Y. The press shown here has a range of

adjustment of 36 in. It will be seen that a pair of non-adjustable pitmans, "solid connections" link the crankshaft to a substantial crosshead. The crosshead carries four nuts suitably geared to an adjusting motor and with fine adjustment by hand. The nuts revolve in unison to ad-



vance the screws which are flanged and bolted to the slide.

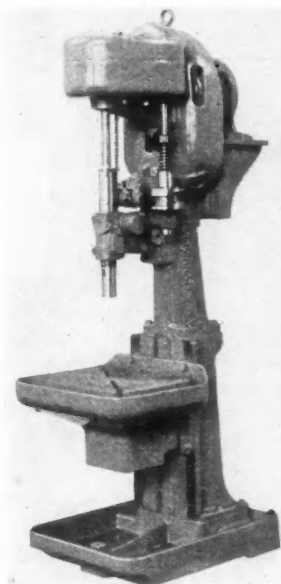
This press is provided with two motors, the adjusting motor being $7\frac{1}{2}$ hp. at 1200 r.p.m.,

PARTS, ACCESSORIES AND PRODUCTION TOOLS

while the main motor is 20 hp. capacity at 1200 r.p.m. Floor space is 115 x 287 in.; total weight 140,000 lb.

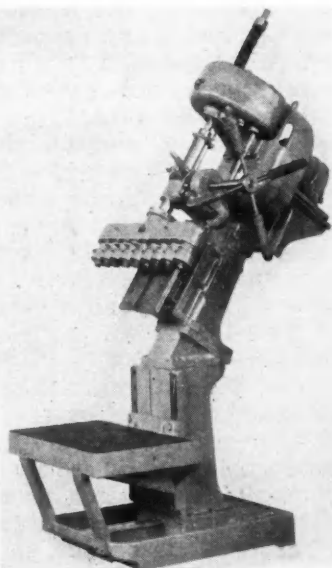
Two Adaptations of Cincinnati Bickford Drive

AN interesting adaptation of the Cincinnati Bickford direct-drive drill is shown. Instead of the usual feeding mechanism, this machine is equipped with a cam feed which automatically advances the spindle into the work at rapid rate, performs a countersinking operation, rapidly withdraws from the work and repeats the cycle. This machine is countersinking automobile spring leaves and operates at the rate of 15 cycles per minute. Note that there is a safety clutch just above the feeding cam which automatically disengages if the feed meets an obstruction. Adjustment is provided to compensate for the



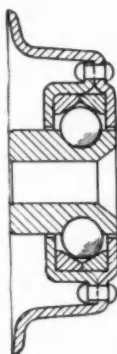
varying lengths of the counter-boring tools.

Another adaptation of this machine is shown in Fig. 2. This also is a standard machine, specially equipped to handle high production drilling. A special block tilts the upper unit back to the proper angle so that oil holes may be drilled in cylinder blocks without making necessary the turning of each cylinder block, which would be required if this were done on a vertical machine. The nine-spindle drill head is supported on an auxiliary guide on the column and is counterbalanced.



Matthews I-Beam Trolley Wheel

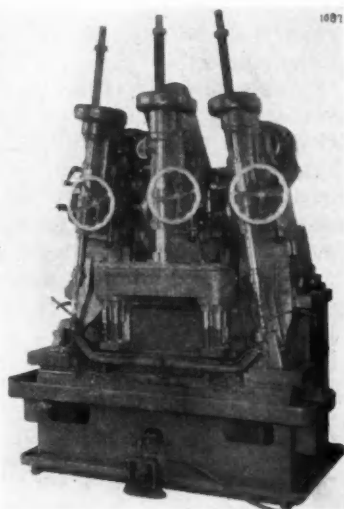
A BALL-BEARING trolley wheel for shop hoists, etc., has been placed on the market by the Matthews Mfg. Co., Worcester, Mass. A sectional view of same is shown herewith. The separate outer races are made of open-hearth, cold-rolled strip steel, case-hardened, and are thoroughly cleaned (not ground) before assembling, to insure a smooth-running surface for the balls. The separate inner retaining member is made of heavy-gage, open-hearth, hot-rolled strip steel pressed to shape. The separate inner race is made of open-hearth, cold-rolled rod, case-hardened. The balls are of chrome steel, hardened and ground, and carefully matched for size. The tire is a separate piece made of heavy-gage, open-hearth, hot-rolled strip steel pressed to shape.



Barnes Special Axle Drilling Machine

AN interesting adaptation of standard units is found in the new axle drilling machine recently built by the Barnes Drill Co., Rockford, Ill. It consists especially of a special one-piece bed, column and table, with two No. 210 end units and the No. 242 center unit. The single-spindle end units are mounted with special 7½-deg. angle blocks adjustable laterally through air cylinders and individually driven. The center head is provided with a 10-spindle aluminum head carrying two clusters of five spindles for drilling the pads.

A coil spring mechanism is used for automatically returning the spindle as soon as the depth of feed has been reached, supplemented by a return brake on the internal feed gear, which stops the upward movement of the spindle-



travel at the moment the twist drill backs out of the work, but with the point of the twist drill still in the bushing. Thus, no rapid approach is necessary, but only a simple movement on the part of the operator to lift in the feed engagement lever after rechucking.

Another interesting detail is the fixture carrying the bushing for the king pin hole which is attached to the wedge block for the outside gang head, at each end of the machine, and thus, this part of the fixture travels laterally with the adjustable heads. This adjustment is under air control with foot pedal, as shown at the front of the machine. Accordingly, the heads move outwardly for reloading, and inwardly to chuck on the ends of the axle forging, bringing the twist drill to the center of the boss, at the same time holding the forging securely during the drilling operation.

Hisey-Wolf Buffing and Polishing Machine

A NEW gooseneck type buffing and polishing machine, their model M, for handling large or odd-size work, is announced by the Hisey-Wolf Machine Co., Cincinnati, Ohio. The motor mounting is of the external type with a rigid four-point support. The motor is ball-bearing equipped and has a dove-tailed sliding base including gib with necessary locking screws. Adjustment is by means of a handwheel and feed-screw, thus facilitating



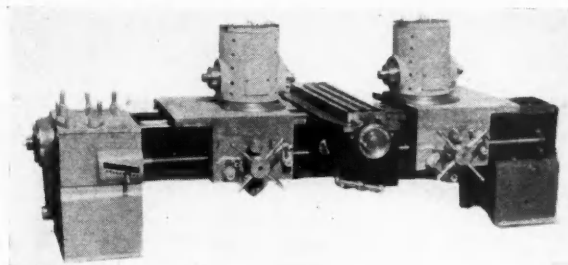
proper belt adjustment and accurate alignment of the motor.

Spindle speed changes can be readily affected by changing the motor pulley—using the same drive. The new design also makes it possible to change the belt without pulling the spindle through the bearing housings since by loosening four bolts on each side the entire spindle assembly may be removed from the machine.

Improved Production Multimechanic Machines

DESIGNED for a variety of general utility operations such as milling, boring, reaming, threading, etc., the improved No. 7 and No. 14 Multimechanics are announced by the Production Engineering Co., Spokane, Wash. Spindles are mounted on Timken bearings and provide twelve speeds each, giving a range of 7 to 1472 r.p.m. for the right-hand spindle and 28 to 368

r.p.m. for the left-hand spindle. The drive pulley is provided with twin disk clutch for starting, stopping, or acting as a brake for the spindles.



The spindles are reversed, elevated or lowered, variably, individually or together, by means of reverse levers which are located on the aprons. The speed levers for both the spindle drives and the quick change gears are located on the left side of the bed.

Weight of 10 ft. bed for the No. 7 machine, 6000 lb.; for the No. 14 machine, 8000 lb.

Automatic Injection Valve Developed by N. A. C. A.

IN report No. 341 of the National Advisory Committee for Aeronautics by William F. Joachim, Chester W. Hicks and Hampton H. Foster, there is described an injection valve designed and developed at the Langley Memorial Aeronautical Laboratory in connection with a general research on aircraft oil engines.

The injection valve designed has only six parts, i.e., two concentric nozzle tubes flared at one end, two body parts, and two nuts. The nozzle tubes are provided with seats at the flared ends to form an annular orifice which automatically varies in area with the injection pressure. Adjustment of the nuts determines the valve-opening pressure. The fuel passage to the orifice is provided by the clearance space between the nozzle tubes. When sufficient oil pressure is developed by the fuel pump, the flared ends of the nozzle tubes move apart slightly, and the oil passes through the annular orifice, producing a broad conical spray. The nozzle tubes are so constructed as to cause the cylinder gases to heat them approximately 500 deg. F., which preheats the oil and tends to reduce the ignition lag.

The results of tests made with the N.A.C.A. spray photography equipment on this injection valve indicate the effect of several factors on spray penetration. For a duration of injection of 0.003 second, and a valve-opening pressure of 2500 lb. per sq. in., a change of injection pressure from 6000 to 10,000 lb. per sq. in. increased the penetration 25 per cent. For a constant speed and fuel quantity per cycle a change of valve-opening pressure from 2000 to 5000 lb. per sq. in., which caused a corresponding change in maximum injection pressure from 6700 to 10,500 lb. per sq. in., increased the penetration 5 per cent. A change of spray-chamber air

density corresponding to a change of compression ratio of from 11.2 to 15.3 decreased the spray penetration 8 per cent. Curves are presented showing these effects together with the effect of engine-operating temperature on the valve-opening pressure.

Analysis and engine tests indicate that the fuel spray from this type of injection valve has characteristics which reduce the time lag of auto-ignition and promote efficient combustion in high-speed oil engines.

Report No. 341 may be obtained upon request from the N.A.C.A. at Washington, D. C.

"Quickwork" Twin Power Hammer

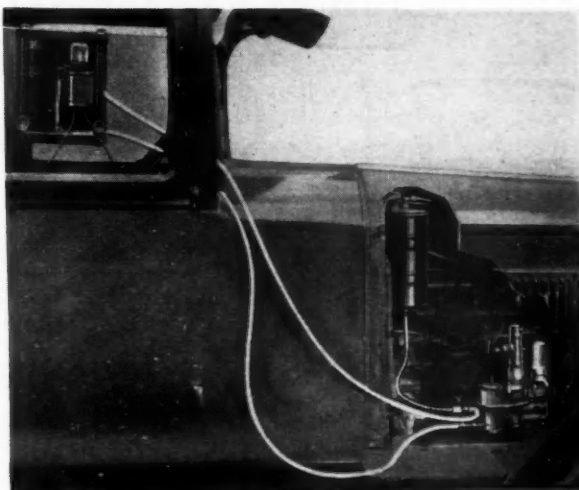
A COMPACT, mobile, twin power hammer unit possessing the same features of design as the individual unit is announced by the Quickwork Co., St. Mary's, Ohio. This machine consists of two single units mounted on a center column which is machined on the surfaces to which the power hammers are mounted, as well as the sides, thus assuring continual alignment of the dies throughout the life of the unit. Between the hammer brackets and the center column is placed a $\frac{1}{4}$ -in. thick leather

spacer to cushion vibrations. Since the center column is machined its full length, the brackets can be raised, lowered or spaced according to requirements.

Motors are unit mounted and each of 2 hp. capacity. Floor space for the unit is 84 x 27 in. Net weight 6130 lb.

Zenith Fuel Mileage Tester

AN instrument for quickly determining the fuel mileage of any vehicle has been placed on the market by the Zenith-Detroit Corp. It consists of a glass bulb having a capacity of 1/10 gal. between graduation marks, the graduation being accurate to within a fraction of one per cent. The tester is hooked over the glass of the right front door and pressed against the glass to attach previously moistened vacuum cups at the rear. Two lengths of rubber hose from the tester are slipped through the wind-



shield and the under side of the hood, and are clipped, respectively, to the fitting attached to the disconnected pipe from the vacuum tank and the fitting attached to the carburetor.

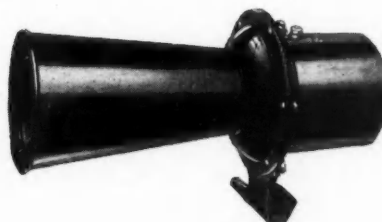
When making a test, the tester control valve lever is set in the "Fuel-to-carburetor" position before the electrical connections are made. When all connections have been made the tester control valve is first placed in the "To-run and ready-to-test" position, and the engine is started and warmed up. This can be done while the vehicle is driven to a stretch of road suitable for the test, a straight, level road preferably without intersections for three miles.

Before starting the actual test the control lever is placed to the "To-run-and-fill" position, and is left there until the bulb is filled beyond the upper graduation mark. The lever is then returned to the former position.

As soon as the car is running at the proper speed, the lever is returned to the former position. As the fuel passes the upper graduation mark the speedometer trip mileage is read, and the mileage is read again when the fuel passes the lower mark. The difference between the two readings multiplied by ten then gives the fuel mileage per gallon.

Motor-Driven Horn By Stewart-Warner

THE Stewart-Warner Corp. of Chicago announces a new model 317B motor-driven horn, illustrated herewith, to meet all demands during the average life of a car.



The outstanding features of this horn are a molded Bakelite commutator—brushes of copper graphite—flexible copper wire pigtails and "lifetime-lubricated" motor bearings. The horn is 11 in. long and has an all-steel shell finished in lustrous hard-baked black enamel.

The outstanding features of this horn are a molded Bakelite commutator—brushes of copper graphite—flexible copper wire pigtails and "lifetime-



THE FORUM

Path is Clear for Automotive Diesel Engines

Editor, AUTOMOTIVE INDUSTRIES:

The article by Robertson Matthews in the April 26 issue of *Automotive Industries* makes out a rather bad case for the automotive Diesel—unjustifiably so, in my opinion. While it is true that present examples of the automotive Diesel cannot meet the torque uniformity and low first cost of the gasoline engine, it is obvious that great improvement can be expected by the time the high-speed Diesel has received say one-tenth the amount of development effort that has been required to bring the gasoline engine to its present state of perfection. His statement that "A carburetor and a pump compare somewhat as foundry and tool-room jobs" is true at present, but it must be remembered that the early carburetors were also made under toolroom conditions.

There is no fundamental reason why the fuel injection systems of the near future cannot be manufactured in quantity at a cost but little greater than that of the complete fuel system on a carbureted engine. This is particularly true for such engine installations as tractors, trucks, motor boats, etc. I agree with the author regarding the improbability of the Diesel invading the pleasure car field in the near future, but feel that the difficulty of obtaining satisfactory torque smoothness at the same engine weight will be the principal deterrent.

Mr. Matthews appears to share a somewhat commonly accepted opinion that very high maximum cylinder pressures are essential to the high-speed Diesel, but a consideration of both theory and actual test results shows definitely that such is not the case.

Doped Fuels Unnecessary

Perhaps the most convincing published proof of this resides in the results given by Harry Ricardo in *The Automobile Engineer* for April of this year, where he reports a maximum pressure of about 850 lb. for full Diesel operation at 2200 r.p.m. and 90 lb. b.m.e.p., with a specific fuel consumption of 0.39 lb. With proper control of combustion by means of correct fuel injection rate and combustion chamber form, the actual difference in fuel economy between the constant volume combustion and a dual combustion having a maximum pressure two-thirds as great is quite insignificant, especially for applications other than aeronautical. Furthermore, since detonation, or too rapid burning, is under full control in the Diesel by the same means as control maximum pressure, there seems to be no reason for the use of doped fuels or fuels of special characteristics.

There are no fundamental difficulties of a technical nature which will prevent or materially delay the de-

velopment of the high-speed Diesel engine. All of the things which must be done have been done as separate accomplishments, but it now remains to incorporate these separate accomplishments into complete engines of marketable characteristics. This is a problem for the liberally-supported and well-equipped development organization, when directed by engineering personnel having proper qualifications. The high-speed automotive Diesel will appear in this country as the result of serious development along lines now well established and which do not include features of an unusual or freakish nature. The path is clear.

LEIGH M. GRIFFITH.

"First" in Front Drive

Editor, AUTOMOTIVE INDUSTRIES:

The writer noticed a short article in *Automotive Industries* of Jan. 25, in which the claim was made that a front-wheel-drive car was manufactured in Germany in 1905, and it might be of interest to know that the writer built a front-drive car in 1905 and operated it in the latter part of that year and in 1906 and 1907 around New York City, and believes that this was one of the first attempts to make a really low-priced practical vehicle with this type of drive. It is true that Walter Christie was experimenting with a front drive at about that time, but his vehicles were not of a commercial type and were racing cars built with the idea of capturing speed records. The car made by the writer was described in *The Horseless Age* of May 22, 1907, and other publications, and was of the three-wheel type provided with a single front driving and steering wheel, as it was the writer's object to obtain the lowest possible cost of construction, combined with the maximum speed and great economy of operation.

The writer's efforts in regard to front drive and four-wheel-drive vehicles were not confined to this three-wheeler, as he designed in 1905 a number of front-drive commercial and passenger vehicles and a four-wheel-drive truck. A description of one form of his front-wheel-drive vehicle was contained in the *Automobile* (later *Automotive Industries*) of Feb. 13, 1908. Not only was this vehicle, as described, front driven and steered, but it was also to be provided with four-wheel brakes, which he advocated, and with single spark and distributor ignition in place of the vibrator coil or magneto ignition which were in use at that time. This vehicle was designed so that the complete engine unit, which included the transmission, steering gear, front wheels and spring, could be removed from the load-carrying portion by undoing a couple of nuts so that

it could be worked on very easily, or a new power unit quickly substituted.

The writer worked out the practical details of several forms of four-wheel-front-drive vehicles but was unable to interest anyone in the front drive proposition and the important patents which he had at that time have long since expired, while many additional applications were abandoned before the payment of the final fee or were not completely prosecuted.

A. E. OSBORN.

Indicated Engine Tests

Editor, AUTOMOTIVE INDUSTRIES:

Re: Letter of Mr. Jacklin in the "Forum," *Automotive Industries*, March 8, 1930.

Since that imaginary person who, according to the belief of Mr. Jacklin, has, prior to 1926, indicated a car engine on the road, has not come forward up till now, may I request the privilege of a few closing remarks to the discussion, which my article in the July 27, 1929 issue of the *Automotive Industries* has evoked?

1. Mr. Jacklin's article in the November, 1929 S.A.E. Journal contains six cards which he states were taken on the road in 1926. They are, however, of so irregular appearance, that with the utmost effort I was unable to get from them any other information but that the indicating mechanism did not work in a satisfactory manner. These cards confirm my previous deduction, that the cited tests

were made on the indicator as such, rather than on the engine.

2. Contrary to the implication of Mr. Jacklin, my indicator is easily adaptable to, and in fact has been used for, testing each cylinder in turn (see article and illustration in *Automotive Industries*, Sept. 23, 1926), which is, of course, preferable to indicating only one cylinder. Owing to the compactness, small size and weight of my indicator even a simultaneous indicating of all cylinders is a practicable proposition. For the same reason the connecting tube can be made so short that even at very high speeds (6000 r.p.m. was successfully investigated) no distortion occurs from this cause.

3. In my paper read before the S.A.E. meeting in January, 1929 (subsequently published in *The Automobile Engineer*, August, 1929), the whole development, extending over nine years, of my indicator was described. There is not the least shadow of a doubt, that my apparatus (built in 1920, first tried in February, 1921, on a car engine in a stripped chassis at standstill) was the first usable indicator built on the phase-by-phase principle. Besides eleven patents in other countries, a United States patent has been granted to me under No. 1,695,591, in which some features embodied in Mr. Jacklin's indicator have been fully described and claimed. Therefore, the two indicators are not so distinctly different from each other as Mr. Jacklin claims them to be.

K. J. De Juhasz,
Assist. Prof. of Engineering Research,
State College, Pa.

Finding Foreign Outlets

(Continued from page 825)

investors in Latin America, we are not too well understood there, and our trade has grown in the fact of the most aggressive competition from Europe."

In discussing trade literature requirements for export sales promotion, John Abbink, vice-president of Business Publishers International Corp., New York, pointed out that English is much more widely read and understood than is generally appreciated.

Spanish will be the next in importance for most products, and it will suffice for all of Latin America for many. The language of Brazil is Portuguese, but experience has proven that a respectable business can be built through trade outlets in Brazil with English and Spanish catalogs, provided they are informative.

"German is becoming of increasing importance once more in some lines, not only for Germany itself, but for Poland, parts of Scandinavia where English is not yet general, Austria, Hungary, Czechoslovakia, etc.," he said.

"With catalogs in English, Spanish and German, and including Portuguese and French when volume justifies or prestige demands them, most export managers will be able to fill the requirements of practi-

cally all of their customers for this type of literature."

Foreign trade practices have been fairly well standardized in the Far East. Here pioneers had a great many disappointments because of lack of knowledge of packaging requirements, labeling and distribution problems.

The Hon. Henry K. Chang, Chinese consul-general at San Francisco, pointed out that in the teeth of frequent disturbances during the last 20 years, China's trade with the United States has grown rapidly. "In 1910, the United States was credited with 5 per cent of our import trade. But today, according to the figures at hand, your total trade with China in 1929 amounted to \$400,000,000, or roughly 25 per cent of China foreign trade. In brief, it has increased five fold in the 20 years under review," he said.

"Your exports to our country consist mainly of petroleum products, silver, tobacco products, cotton, flour, machinery, steel, electrical equipments and automobiles. All these are, as you can see, manufactured or finished products, whereas our exports to the United States consists mainly of raw materials, such as raw silk, wool, wood oil, tin and antimony."

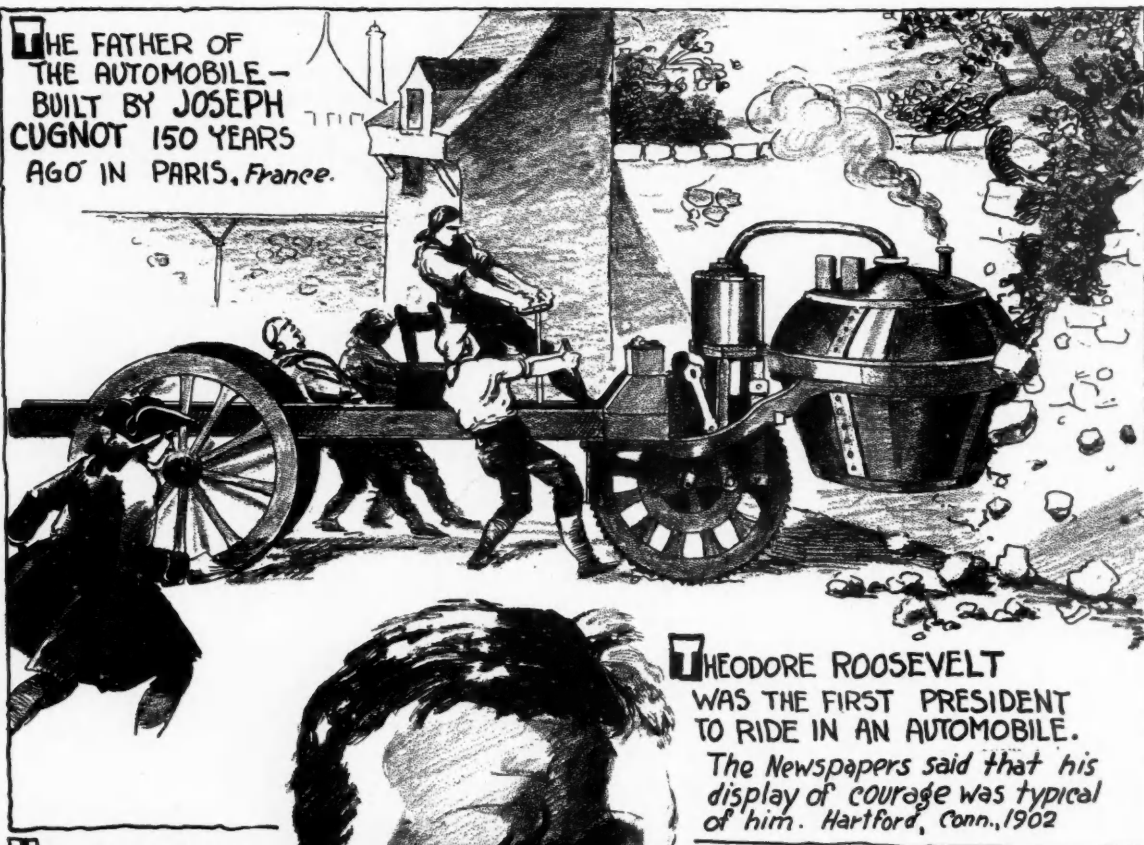
Wage Values

INDEX figures showing progress in the purchasing value of wages, compared with 100 in each country as of 1913:

	U. S.	Germ.	Eng.	France	Belg.	Italy
1924..	178	89	88	92	66	64
1928..	172	118	108	92	82	93
1929..	181	121	110	96	93	82

Automotive Oddities

by Pete Keenan



U.S. MAIL TRUCKS USE CONFISCATED LIQUOR IN THE RADIATORS AS AN ANTI-FREEZE.



Pete Keenan

News of the Industry

PAGE 851

VOLUME 62

Philadelphia, Saturday, May 31, 1930

NUMBER 22

Bendix Nominated S. A. E. President

Officers and Council for 1931
Selected as Summer Meet-
ing Nears End

FRENCH LICK, IND., May 28—Vincent Bendix, president, Bendix Aviation Co., was nominated president of the Society of Automotive Engineers at the twenty-fifth anniversary session tonight at French Lick Springs. Vice-presidents, who, with the president and other officers will take office at the annual meeting next January, are Dr. G. W. Lewis, aircraft engineering; Arthur Nutt, aircraft engine engineering; W. F. Joachim, Diesel engine engineering; John A. C. Warner, passenger car engineering; Carl Parsons, passenger car body engineering; Frederick K. Glynn, transportation engineering. Councillors nominated were Fred S. Duesenberg, Norman G. Shidle and Charles L. Tiltson. C. W. Spicer was named treasurer.

Six of the first members of the organization were called to the speakers table and honored by president Edward P. Warner. They were Andrew L. Riker, first president; E. T. Birdsall, first secretary; P. M. Heldt, engineering editor, *Automotive Industries*; Colonel H. W. Alden; Colonel G. W. Wall and H. G. Chatain. Coker F. Clarkson, for 20 years manager of the society was elected the first honorary member, a distinction held only by himself.

Alvan Macauley, president of the National Automobile Chamber of Commerce spoke from Detroit over an amplifier and congratulated the engineers upon their cooperative efforts in solving problems of the industry.

Hugh Johnson With Olds

DETROIT, May 27—Hugh A. Johnson, formerly with Hupp Motor Car Corporation, has been appointed assistant chief engineer of the Olds Motor Works in charge of design engineering, according to an announcement by C. L. McCuen, director of engineering at Olds. Mr. Johnson was with Hupp for between 19 and 20 years past working up through various positions in the engineering department.

— Regrets —

Coker F. Clarkson, secretary of the Society of Automotive Engineers, was unable to attend the summer meeting at French Lick because of poor health. The following telegram, expressive of the Society's regrets, was sent to him at his home in Briarcliff Manor, N. Y.

"The Society of Automotive Engineers assembled here, missing your genial presence, send you their heartiest greetings and sincere good wishes for a speedy and full recovery."

E. P. WARNER,
President.

Sees Better Exports

DETROIT, May 27—Walter R. Glennie, export sales manager of the Graham-Paige Motors Corporation, who has returned from an extended trip visiting dealers in Argentine, Brazil, Chile, Peru, Paraguay and Uruguay, said today that the automobile export trade of this country with South America is firmly established, and while conditions now are a little below normal, due to temporary political and economic situations, there is every reason to believe that American-made cars will continue to outsell others in this field.

Building Increases 11.1%

WASHINGTON—An increase of 11.1% in total building operations in April, as compared with March, was reported by the Department of Labor.

The report is based on figures received from 285 cities of a population of more than 25,000 persons. Estimated cost of building operations in these cities during April was \$179,891,611, compared with \$161,910,584 in the previous month.

Jordan of Peugeot Here

NEW YORK, May 27—Murray M. Jordan, secretary general of Automobiles Peugeot S.A., France, arrived in New York today aboard the S.S. France. He will join Jean Pierre Peugeot, who arrived last week.

Seek to Eliminate Headlight Dazzle

Third National Safety Conference Hears Recommendations of Engineers

WASHINGTON, May 28—Discussion at the second morning session of the Third National Conference on Street and Highway Safety centered about the headlighting requirements, recommended by the committee on the maintenance of the motor vehicle, for which William Candler, Jr., Atlanta, presented the report.

The report presented by the committee made the following recommendations with regard to headlights: the lamps must be so aimed that the top of the beam is horizontal. The top of the upper beam of depressible beam equipment should be horizontal when the car is empty. When the car is equipped with single beam headlights, the top of the beam should be horizontal when the car is loaded. Considerable opposition to these recommendations developed from the highway commissioners and motor vehicle commissioners group, which felt that the recommendations cited would not adequately control the problem of dazzle under night-driving conditions.

A report submitted by a joint committee of the Society of Automotive Engineers and the Illuminating Engineers Society, incorporating suggestions and technical procedure for carrying out the recommendations of the maintenance committee, was rejected last night by the drafting committee of the conference.

Revision of the Uniform Motor Vehicle Registration act to permit states full licensing reciprocity with respect to trucks engaged in interstate commerce was recommended by the drafting committee at last night's session. If this revision is accepted by the conference it will tend to eliminate duplicate taxation, through duplicate licensing of interstate truck and bus operators.

In the absence of William E. Metzger, of the Federal Motor Truck Co., chairman of the executive committee of the safety conference and a director of the N. A. C. C., Colonel A. B. Barber presided at the Monday sessions, which were opened by President Hoover and

(Continued on Page 854)

Men of the Industry and What They Are Doing

Supervisor of Auburn's District Sales Managers

Announcement was made by N. E. McDarby, director of sales for Auburn, of the appointment of H. G. Hersh as supervisor of 15 district sales managers for the company. Mr. Hersh, at present advertising and sales promotion manager for Auburn, will continue in that position, adding his new duties.



H. G. Hersh

Enlargement of the Auburn sales organization and the addition of nearly 200 new dealers in the last 90 days have made the new position necessary, McDarby said.

Warman to Ford Glass

Announcement is made by G. P. MacNichol, Jr., vice-president in charge of sales of the Libbey-Owens-Ford Glass Company, that Bryan Warman has been appointed advertising manager of the company.

Mr. Warman was identified several years with Dodge Brothers, in which service he specialized in sales quota studies and territory analyses. Joining the staff of George Harrison Phelps, Inc., he was associated in the next six years with practically every department of advertising agency work, including production, media, outdoor and research divisions. Immediately prior to his present appointment Mr. Warman was advertising manager of Durant Motors. He will make his headquarters in Toledo.

Hunt Goes to Bendix

TOLEDO, May 26—Warren T. Hunt, patent attorney for the Willys-Overland Co. for 14 years, has resigned to accept a similar place with the Bendix Brake Co., South Bend, Ind. He will take up his new duties June 1.

Johnson Joins Hoover Ball

H. E. Johnson has joined the sales organization of the Hoover Steel Ball Co., Ann Harbor, Mich. Mr. Johnson was formerly sales manager of the Strom Steel Ball Co. of Chicago.

Madge Elected Secretary

DETROIT, May 24—Edward S. Evans, president of the Detroit Aircraft Corp., has announced the election, by the board of directors, of A. D. Madge as secretary and treasurer of the company. Madge comes to Detroit Aircraft from the Arthur Anderson Co. of New York, where he was senior accountant. He has been a senior certified public accountant for eight years.

United Motors Appoints Potter Sales Head



W. N. Potter

Announcement of the appointment of W. N. Potter as director of sales for United Motors Service has just been made at Detroit by F. A. Oberheu, president and general manager. At the same time, Mr. Oberheu announced appointment of W. G. Hinnau as sales manager.

Mr. Potter has been connected with United Motors Service for the past 11 years. For seven years he has been in charge of the company's sales of Jaxon rims, rim parts and wheels, and AC products. During the past three years he has been assistant to the director of sales.

Mr. Hinnau has been with United Motors for the past 10 years in various sales capacities. Six years ago he was appointed manager of the Los Angeles Branch, holding that position until a year ago.

Johnson Now Chief

The appointment of S. Johnson, Jr., as chief engineer has been announced by the newly formed Bendix-Westinghouse Automotive Air Brake Company at Pittsburgh. In assuming his new responsibilities, Mr. Johnson has, as a background, many years of service and a broad experience in automotive circles.



S. Johnson

Olds Motor Works Promotes J. W. Schiller

DETROIT, May 26—James W. Schiller, who for the past 11 years has been doing special field service work for the Olds Motor Works, Lansing, Mich., has been appointed technical supervisor of the parts and service department, according to an announcement made yesterday by C. R. Todd, general service manager.



James W. Schiller

Mr. Schiller succeeds Grant B. Sturgis, who has been transferred to the central office of General Motors for special work in service activities. Mr. Schiller was a member of the Marmon racing squad which competed at the opening of the Indianapolis track in 1909. The following year he joined the Olds organization and became a member of the Oldsmobile racing team competing in the Vanderbilt cup race on Long Island, N. Y.

Schroeder With Republic

H. S. Schroeder has been appointed western manager of sales for the Republic Steel Corp., with headquarters in Chicago, it was announced by H. T. Gilbert, vice president in charge of sales of the corporation. Mr. Schroeder formerly was vice-president and general sales manager of the Interstate Iron & Steel Co., Chicago.

Callahan With Briggs Mfg.

J. A. Callahan, formerly vice-president and general manager of Martin Parry Corp., and more recently manager of the Buffalo plant of Curtiss Wright Corp., has become associated with Briggs Manufacturing Co.

Dahlquist Appointed

Charles S. Dahlquist has been appointed automotive sales engineer of the Keasbey Mattison Co. of Ambler, Pa. Mr. Dahlquist will have his headquarters in Detroit.

McCall With Putnam Tool

Manning, Maxwell & Moore, New York, announces the appointment of Chas. D. McCall to take charge of sales of Putnam Machine Tools, Detroit.

Gilbert W. Lee

DETROIT, May 27—Gilbert W. Lee, one of Detroit's best-known business men, died of heart disease while attending an executive committee meeting of the First National Bank. Mr. Lee was a director of Graham-Paige Motors Corp.

Exports, Imports and Reimports of the Automotive Industry for April of Current Year, and Total for Four Months Ended April, 1930

	Month of April		Four Months Ended April		Four Months Ended April	
	1929	1930	1929	1930	1929	1930
EXPORTS						
Automobiles, parts and accessories	Number 18	Value \$63,879,911	Number 5	Value \$35,111,115	Number 30	Value \$245,036,408
Electric trucks and passenger cars	18	13,108	5	6,987	29	29,628
Motor trucks and buses except electric (total)	16,705	10,248,825	11,461	7,637,056	74,421	42,988,268
Up to one ton, inclusive	10,960	5,255,840	2,963	1,888,199	55,183	23,974,049
Over 1 and up to 2 1/2 tons	5,430	4,281,871	7,764	4,430,931	17,960	15,736,061
Over 2 1/2 tons	315	711,114	734	1,317,926	1,278	3,278,158
PASSENGER CARS						
Passenger cars except electric (total)	47,732	31,691,481	23,777	15,402,560	157,087	108,427,565
Low price range \$1,000 inclusive	38,762	20,052,614	18,376	8,953,827	119,190	61,297,011
Medium price range \$1,000 up to \$2,000	7,903	8,953,417	4,705	4,784,552	33,483	36,605,563
High price range over \$2,000	1,067	2,685,450	696	1,664,181	4,414	10,524,991
PARTS, ETC.						
Parts, except engines and tires	..	..	..	..	..	..
Automobile unit assemblies	..	13,946,286	..	6,120,882	..	53,955,644
Automobile parts for replacement (n.e.s.)	..	5,536,593	..	4,423,499	..	29,982,321
Automobile accessories	..	997,786	..	597,590	..	4,035,222
Automobile service appliances (n.e.s.)	..	697,236	..	614,400	..	2,474,836
Trailers	55	29,780	376	31,627	323	158,198
Airplanes, seaplanes and other aircraft	28	537,526	18	288,603	97	1,641,046
Parts of airplanes, except engines and tires	..	171,607	..	134,234	..	656,552
BICYCLES, ETC.						
Bicycles	367	9,510	304	8,453	2,075	53,361
Motorcycles	2,845	600,461	1,737	419,023	8,372	1,874,023
Parts and accessories, except tires	..	101,487	..	111,282	..	430,879
INTERNAL COMBUSTION ENGINES						
Stationary and Portable	..	..	..	..	..	..
Diesel and Semi-Diesel	85	189,167	10	32,504	379	452,111
Other stationary and portable:	..	..	..	..	..	..
Not over 10 H.P.	4,108	348,769	2,043	177,033	13,685	1,213,933
Over 10 H.P.	836	281,045	650	432,061	1,881	829,558
Automobile engines for:	..	..	..	..	..	..
Motor trucks and buses	421	74,877	3,341	272,456	5,316	680,483
Passenger cars	14,558	1,504,548	5,394	552,436	47,195	4,915,171
Tractors	76	15,195	23	6,869	386	100,452
Aircraft	28	139,232	29	109,324	150	624,155
Accessories and parts (carburetors)	..	440,483	..	346,673	..	1,587,230
IMPORTS						
Automobiles and chassis (dutiable)	63	142,765	38	69,431	177	404,647
Other vehicles and parts for them (dutiable)	..	204,399	..	26,644	..	542,933
REIMPORTS						
Automobiles (free from duty)	69	66,539	36	22,598	162	203,170

E.A.T. Elects Morgan

Thomas A. Morgan has been elected vice-president of Eastern Air Transport, Inc. Mr. Morgan is president of Sperry Gyroscope Co., subsidiary of North American Aviation, and is vice-president of Ford Instrument Co. and Intercontinent Aviation, Inc., also subsidiaries of North American Aviation.

Perfect Circle Earnings Better

CHICAGO, May 26—It has been unofficially stated here that net earnings for the Perfect Circle Company for May will probably reach a high monthly record. The present rate of earnings is being attained despite a slightly reduced volume of sales, as compared with the corresponding 1929 period. The volume of business month by month has shown a steady increase, as compared with the same periods last year.

New Ford Truck

DETROIT, May 26—Ford Motor Co. has introduced a new 1 1/2-ton truck with 157-in. wheel base, listing at \$545 for the chassis with single wheel. An additional charge of \$25 is made for double wheels and cab is \$90. This truck is 25 in. longer than the wheel base of the other Ford Trucks.

Horace M. Jerome

DETROIT, May 28—Horace M. Jerome, formerly chief engineer of the Chalmers Motor Car Co. and a charter member of the S.A.E., died suddenly at his home in Ann Arbor, Mich., on Monday. Mr. Jerome was vice-president and chief engineer of the Field-Jerome Laboratories of Detroit.

Firestone Earns 23 Cents

CLEVELAND, May 26—Report of Firestone Tire & Rubber Co. and subsidiaries for six months ended April 30, 1930, shows net profit of \$2,320,118 after depreciation, interest, Liberia development expenditures, federal taxes, etc., equivalent after dividend requirements on preferred stock to 23 cents a share (par \$10) on 2,239,860 shares of common stock.

Borg-Warner Cuts Dividend

CHICAGO, May 26—Borg-Warner Corp. has declared a quarterly dividend of 75 cents on the common, placing the issue on a \$3 annual basis, against \$4 previously. The regular quarterly dividend of \$1.75 on the preferred has been declared, both dividends payable July 1 to stock of record June 16.

Automotive Brevities

Commonwealth Brass Corp., Detroit, has announced the opening of a district sales office at 205 West Wacker Drive, Chicago, in charge of C. A. Bierma as resident sales engineer.

United States Pressed Steel Co., Ypsilanti, Mich., has purchased from the Youngstown Sheet & Tube Co. its plant and business at Kalamazoo, Mich., known as the Harrow Spring Co., and will take control as of June 1.

Marquette Tool & Mfg. Co., Chicago, announces that it is now located at 6500 W. 65th St., Chicago.

Dallas Brass & Copper Co., division of Revere Copper & Brass, Inc., have moved their office to a new address at 2200 N. Natchee Ave., Chicago.

The Bristol Co., Waterbury, Conn., has been granted a manufacturing and selling license by the Dardet Threadlock Corp., under its patent for self-locking screw threads.

Packard Reduces Prices

DETROIT, May 28—Packard Motor Car Company today announced a reduction of \$400 on each of the eleven body models of its Standard Eight line, bringing the list price of most of this line, which is known as the 733, to just above \$2,000. This announcement is in line with Packard practice of several years. The present reduction has been made in anticipation of a new model to be brought out by Packard next fall.

Griffith Leaves Industry

TOLEDO, May 26—Warren E. Griffith, leader in automotive dealer circles in Toledo for 19 years and for nearly two years president of the National Automobile Dealers Association, has announced his withdrawal from the industry to become sales executive of the Air-Way Electric Appliance Corp. on the Pacific Coast in June.

Mr. Griffith will retain his interest in the Landman-Griffith Co., local Chrysler dealers, but his duties will be taken over by Samuel T. Keller, who has been sales manager of the company ever since he left Chevrolet in 1928. Charles P. Landman will remain as secretary-treasurer. Keller is a brother of K. T. Keller, vice-president and general manager of the Chrysler Corp.

Erastus P. Gavit

Erastus Palmer Gavit, for many years director and secretary of the Ludlum Steel Company, died on May 20th at Santa Barbara, Calif. A personal message of regret accompanying the announcement was forwarded by Edwin Corning, president of the company.

Distributors to Study Unfair Truck Ordinances

Illinois Organization Seeks Reaction
on Proposed Laws and Taxes

CHICAGO, May 26—Members of the Motor Truck Distributors Association of Illinois will consider taxation, legislation and other matters vitally concerning motor truck owners and operators at a representative dinner-meeting June 3, in the Hotel Stevens. The chief purpose of the meeting, said H. C. Allison, president, will be to get the reaction of leading groups and interests employing motor trucks to various proposed ordinances and bills in which municipal and state legislators are reported interested.

The association has always taken a stand in favor of reasonable and logical legislation and taxation, Mr. Allison says. "The meeting we are to hold will be chiefly for the purpose of frank discussion," he added. "It will bring forth ideas on what constitutes good and ill-advised motor truck legislation. While the motor truck industry should not get more than reasonably special consideration from the lawmakers, there is a strong and growing feeling among owners and users in all lines of business that commercial vehicles should not be discriminated against."

Chrysler Building Opened

NEW YORK, May 27—The Chrysler Building, New York City's tallest structure, was opened today, with Walter P. Chrysler, president of the Chrysler Motor Corp., and former Governor Alfred E. Smith as guests of honor, of the Forty-second St. Property Owners and Merchants Association.

A bronze tablet was unveiled in the lobby of the building "in recognition of Mr. Chrysler's contribution to civic advancement."

A feature of the structure, which is seventy-seven stories high, is the execution of mural paintings covering the lobby ceiling, depicting the mechanical age and man's use of energy.

Union Employment Gains

WASHINGTON, May 27 — Trade unions in 24 cities report only slight improvement in employment during May, according to William Green, president of the American Federation of Labor.

"Our figures show 20 per cent out of work in May as compared to 21 per cent in April (revised figures)," Mr. Green continued. "The last two months have failed to show the usual Spring improvement, due partly to the serious situation in building, and also to the general slow recovery of trade and industry."

Service Association Smoker

NEW YORK, May 27—The Automotive Service Association of New York will hold its annual smoker at the American Women's Association auditorium, on June 12. This is the last meeting of this season, and no business other than the induction of new officers will be transacted at this time.

Airplane Eye

A radio television system, which enables an airplane pilot to "see" the plan of a landing field below him, despite thick fog, has been developed by John Hays Hammond, Jr. The system operates through a three-point radio beacon and miniature television equipment combined.

Registrations Slump

April registrations of new passenger cars were 27 per cent behind the same month last year in the 33 states and the District of Columbia, for which totals are at present available. This is a larger percentage loss than in any of the three preceding months of this year. Moreover, on the basis of these returns, April sales registered only about half the normal seasonal gain over March.

In this group of states Ford is ahead 3 per cent, Chevrolet is off 14 per cent, and all other makes combined show a loss of 49 per cent, from April, 1929.

P. A. Derham Moves

INDIANAPOLIS, IND., May 27—P. A. Derham, formerly president of the Floyd Derham Body Company of Philadelphia, has become associated with the Duesenberg Company of this city, H. T. Ames, vice-president, announces. Derham will be in charge of the custom body department and has already assumed his duties.

To Eliminate Dazzle

(Continued from Page 855)

Secretary of Commerce Lamont.

A telegram was received from Mr. Metzger announcing that he was confined to his bed. The conference voted that he should receive the sympathy of the body.

Automotive men registred at the first day's sessions included: R. J. Alden, Bendix Aviation Corp.; Leon F. Bani-gan, Editor, *Motor World Wholesale*; David Beecroft, vice president, Bendix Aviation Corp.; Major W. S. Bouton, Indian Motorcycle Co.; Norman Damon, National Automobile Chamber of Commerce; Leland W. Fox, Firestone Tire and Rubber Co.; C. C. Hanch, manager, National Association of Finance Companies; H. J. Hunt, General Motors Corp.; Lieut.-Col. Frank S. Long, Indian Motorcycle Co.; Edward F. Loomis, secretary, truck committee, National Automobile Chamber of Commerce; W. C. Parker, truck committee, National Automobile Chamber of Commerce; Alfred Reeves, general manager, National Automobile Chamber of Commerce; Pierre Schon, General Motors Truck Co.; G. M. Sprowls, Goodyear Tire and Rubber Co.

Gen'l Motors Preferred Stock Plan Approved

New \$5 Senior Security Will Replace
Former 7% Preferred

WILMINGTON, DEL., May 26—At a special meeting of stockholders of the General Motors Corp., which was held here today, approval was given charter amendments proposed by the directors that will simplify the preferred stock issues by the exchange of new 5 per cent preferred for the issues of 6 and 7 per cent preferred now outstanding.

There is to be a new class of preferred stock without par value, to consist of 6,000,000 authorized shares. To permit of flexibility it may be issued in series which may vary in respect of rates of dividends and price of redemption, as fixed by the board of directors, except that 1,875,366 shares, constituting the \$5 series, are to be offered at present in exchange for the outstanding preferred shares.

When the present preferred stocks are retired or exchanged, the new \$5 preferred will occupy a first preferred position in respect to dividends and assets, and in general will enjoy the privileges, preferences and benefits accruing to the 7 per cent preferred.

The directors have authorized the entering into a contract with J. P. Morgan & Co. underwriting the offer of 1,875,366 shares of the new \$5 preferred by which they will agree to purchase or find purchasers for such shares as may not be exchanged.

Auto-Lite's Russian Order

TOLEDO, May 26—Automobiles produced by the Russian government will be equipped with electric starting, lighting and ignition equipment made to specifications of the Electric Auto-Lite Company in accordance with a contract recently negotiated between the united electrical industries of the Soviet union and the Toledo Company through the Amtorg Trading Corporation.

A. E. Buchenberg, vice-president of Auto-Lite, has just returned from a trip abroad during which time he spent three weeks at Moscow and Leningrad inspecting plants of the Electric Equipment Trust, and advising plant executives on future business.

G. M. Truck Plant

DETROIT, May 27—Construction of the \$250,000 addition to the plant of the General Motors Truck Co., Pontiac, Mich., was begun yesterday. The building, which is 18 ft. x 580 ft., one-story high, will be used for engineering and warehouse purposes. It is to be completed in 60 days. An additional quarter million dollar investment will be necessary to equip it. Officials of the company pointed out that the structure has been needed for some time to facilitate present operations, and that its erection at this time does not necessarily mean a general increase of production.

Fokker-Dornier Linked in General Aviation Co.

General Motors Expected to Hold Control of New Company

NEW YORK, May 26—Fokker Aircraft Corp. of America has called a special meeting of stockholders for June 18 to approve a change in corporate structure involving the change of name to General Aviation Corp., and the increase of capital stock from 1,000,000 to 5,000,000 shares with no par value. Harris M. Hansue, president of Fokker, who made the announcement, stated that the change is proposed to enable the directors to carry out an expansion program which contemplates that the company will become a holding company owning stock in subsidiary manufacturing and operating companies whose management and activities will be unified through the control maintained by the parent organization.

The manufacturing activities at present carried on by the Fokker company will, if the plan be approved, be carried on by a wholly owned subsidiary company. Arrangements have been made to secure the American manufacturing and sales rights for the Dornier flying boats, at present lodged with the Dornier Corp. of America, owned jointly by Fokker and General Motors. The American Dornier company will thus become a wholly owned manufacturing and sales subsidiary of General Aviation Corp.

Dr. Claude Dornier has made his services available to the American company bearing his name.

The announcement states that no exchange of existing stock is contemplated in the new capitalization. The additional 4,000,000 shares will be utilized for the acquisition of additional property for which negotiations are now being carried on. While nothing has been stated officially as to what additional properties are being sought, it is thought that the company, which is already firmly entrenched in the commercial transport field, may be seeking a company manufacturing an airplane for private use, and also a manufacturer of engines, rendering it independent of competing companies in this line. It is possible in this connection that the company may secure from General Motors, which at present owns 40 per cent of Fokker, the assets of the Allison Engineering Co., acquired some time ago, and the more recently acquired Winton Engine Co.

No announcement has yet been made as to the place of General Motors Corp. in this new set-up, but it is assumed that it will continue to hold a controlling interest in the new company. It now owns 400,000 shares of Fokker stock, and will doubtless acquire sufficient stock in the new company so that it will maintain at least the same ratio of stock ownership. While it is pure surmise, it is possible that some of this additional stock may be acquired in exchange for the Allison and Winton companies, its interest in American Dornier, and other aviation interests now held by General Motors. It is generally assumed that this whole plan is a move on the part of General Motors to consolidate its aviation interests, and to assume a more active position in the aviation field than it has heretofore seen fit to take.

Canadian Fees Increased

OTTAWA, May 27—Total revenue of Canadian provinces and Yukon territory for automotive fees and from collection of gasoline tax amounted to \$41,274,573 in 1929, against \$31,216,870 in 1928, according to Dominion Bureau of Statistics.

Revenue from registrations, etc., totaled \$22,514,030 against \$18,816,417 in 1928, and taxes from sale of gasoline increased to \$18,760,543 from \$12,400,453, due partly to increases during the year to a five cent per gallon tax from three cents in Ontario and Alberta.

Business in Brief

Written by the Guaranty Trust
Co., New York, exclusively for
AUTOMOTIVE INDUSTRIES.

NEW YORK, May 26—The volume of wholesale and jobbing trade last week continued moderate. The large amount of unemployment undeniably is adversely affecting retail trade. The level of employment in outdoor activities, however, has increased. On the whole, business still compares unfavorably with that a year ago.

LIFE INSURANCE SALES

Sales of ordinary life insurance during April were 4 per cent above those a year ago. In every month so far this year, life insurance sales have been above those in the corresponding month last year, while in March a new high record was made for sales in a single month.

INDUSTRIAL ACTIVITY

Industrial activity during April, based on the consumption of electrical energy by manufacturing plants, remained at about the same level as that in the preceding month, but was 11.9 per cent below that a year ago.

CRUDE OIL PRODUCTION

Average daily crude oil production for the week ended May 17 was 2,607,900 barrels, as against 2,595,150 barrels for the preceding week and 2,643,550 barrels a year ago.

FREIGHT LOADINGS

Railway freight loadings for the week ended May 10 totaled 933,931 cars, which marks a decrease of 115,029 cars below those a year ago and a decrease of 68,480 cars below those two years ago.

FISHER'S INDEX

Professor Fisher's index of wholesale commodity prices for the week ended May 24 stood at 88.4, as against 88.7 the week before and 89.0 two weeks before.

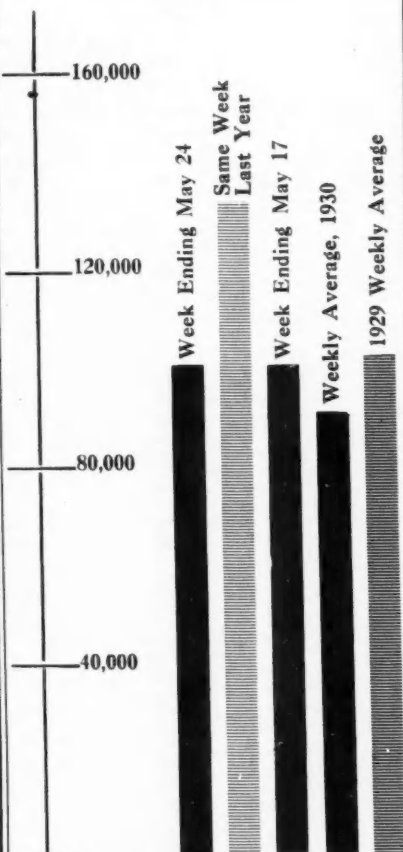
STOCK MARKET

The stock market last week showed a distinct downward trend, although there were sizable reactions from time to time. The weakness of the steel shares was due to the current unfavorable reports from that industry. The volume of trading was on a greatly reduced scale, and on Thursday the number of transactions amounted to only 1,860,220 shares, the smallest full day's business since January 13. Call money remained at 3 per cent.

FEDERAL RESERVE STATEMENT

The consolidated statement of the Federal Reserve banks for the week ended May 21 showed increases of \$15,800,000 in holdings of bills bought in the open market and of \$400,000 in holdings of Government securities. There were decreases of \$500,000 in holdings of discounted bills and of \$5,200,000 in member bank reserve deposits. The reserve ratio on May 21 was 83.5 per cent, as against 83.6 per cent a week earlier and 83.0 per cent two weeks earlier.

Automotive Industries
Production Chart
Weekly



The composite chart appearing above will delineate each week production of passenger cars in the United States and Canada, for the week preceding publication of the issue in which it appears, together with production for the preceding week, and other factors. Data used in compiling it are obtained in confidence from a number of sources. Other factors may be added, dependent upon the cooperation of additional sources of information.

Automotive Construction Shows Slight Improvement

Recovery Appears Evident as Week's Report Indicates Gain

PHILADELPHIA, May 29—As the month draws to close, automotive plant construction and addition programs have shown a gain in volume over the preceding week, according to reports received by *Automotive Industries*.

Estimates of total construction announced thus far this year compare favorably with the totals for the first five months 1927, and approximate the figure for the same period of 1928, but fall about 30 per cent under the high 1929 mark for January, February, March, April and May.

Machine tool sales were generally spotty. Except for several substantial export orders, they are considerably less than the totals for the same period last year.

Among the building reports received last week were:

George G. Miller, New York architect, has plans for \$120,000 automobile repair shop and garage.

Walden Aircraft Corp., Long Island City, N. Y., leased a factory to manufacture aircraft equipment.

S. Pelton, New York architect, has plans for \$110,000 service and repair garage.

U. S. Navy (bureau of yards and docks) Washington, D. C., plans \$150,000 mechanical repair shop, storage facilities, etc., at Lakehurst, N. J., air station.

Norma-Hoffmann Bearings Corp., Stamford, Conn., will soon award contract for \$125,000 manufacturing addition to plant.

Brown Instrument Co., Philadelphia, planning \$75,000 addition to manufacturing plant. Ballinger Co., architect and engineer.

Messinger Bearings, Inc. (roller bearings), Philadelphia, filed plans for \$25,000 addition.

Kelso Mfg. Co., Trenton (brake lining, clutch facing, etc.), plans rebuilding part of mill recently destroyed by fire.

Motor Wheel Corp., Lansing, has arranged for new stock issue of 25,000 shares. Acquisition of Cleveland Welding Co., Cleveland, is contemplated.

Muskegon Motor Specialties Co., Muskegon, will increase capital stock from 125,000 to 500,000 no par shares. Acquisition of Jackson Motor Shaft Co. is contemplated.

Jacob Ernst, Spokane, Wash., is erecting a one-story garage, 60 x 100 feet, brick construction, for the use of the American Railway Express Agency. Cost of building is to be \$7,500.

Jones Radiator Shop, Spokane, Wash., is erecting a brick and concrete building on Second between Monroe and Madison, to cost \$20,000.

The Quality Tire & Electric Company, E1919 Sprague, Spokane, Wash., is erecting a shop building and display room, 50 x 120, adjoining its present quarters. Cost will be \$13,000.

Collier Motor Company, Freewater, Ore., plans to erect a garage building to cost \$9,000.

Prest-O-Lite Company's plant at Spokane, Wash., will be completed July 1. Cost will be \$65,000, the main building being 100 x 185 feet.

The Ray Tennes Motor Company, Chicago, has started construction on its new home. The project, to be completed by Aug. 15, will represent an investment of \$150,000.

Buys Defiance Stamping

TOLEDO, May 26—Richard L. Serrick of this city has purchased control and assumed the management of the Defiance Stamping Co., of Defiance, Ohio, it was announced here today. Serrick has had long association with the automotive industry, having been with the Dura Co. and the Saxon Stamping & Die Co.

Canada's Tourist Trade

Cars entering the Dominion of Canada from the United States for touring purposes totaled 4,508,809 in 1929 against 3,645,455 in 1928 and gross value of automobile tourist trade is estimated at \$208,744,000 against \$183,576,000. Canadian cars entering the United States for touring purposes increased to 619,572 from 519,871 and expenditures were \$65,055,000 against \$57,186,000 in 1928.

Crude Rubber at Low

NEW YORK, May 26—Crude rubber prices reached the lowest prices recorded on both the New York and London markets, last week, according to F. R. Henderson Corp., in its weekly market letter. Stocks in London increased to 76,932 tons with those in Liverpool, also increased to 24,448 tons. World stocks as of April 30 are estimated at 420,500 tons.

Cable advices from Singapore state that Asiatic producers have passed a resolution asking the government to declare Sunday a rest day. The resolution also suggests legislation prohibiting the export of any but smoked sheets and crepe. It was further suggested that the government call a conference of producers and officials "to evolve a scheme to save the industry."

Toledo Employment Drops

TOLEDO, May 26—Employment in Toledo plants has shown a slump during the last two weeks, but proportionately less than in the same season last year. Fifty-one plants show 26,146 workers now, as compared with 43,576 at same time last year. Electric Auto-Lite is running full time, Champion Spark Plug is on normal schedule, but operations at Chevrolet Motors Ohio Co. and Willys-Overland are restricted.

Aircraft Rules for R-100

WASHINGTON, D. C., May 26—Special air regulations for the control of heavier-than-air aircraft operations during the visit to Canada of the British airship R-100 have been promulgated by the Controller of Civil Aviation of Canada.

Monighan Net Increased

CHICAGO, May 23.—Net income of the Monighan Manufacturing Corporation for the four months ending April 30, 1930, amounted to \$65,131, after all charges and taxes, equal to \$1.62 a share on 40,000 shares of class A stock outstanding.

Edward J. Woodison

DETROIT, May 26—Edward J. Woodison, 55 years old, president of the E. J. Woodison Co., founders, and former president of the Acme Foundry Co., and vice-president of the Canadian Foundry Supply & Equipment Co., of Montreal, died last week at his home at Commerce, Mich., following an illness of four days.

Pace of Steel Demand Continues Leisurely

Semi-Finished Stock Follows Price Trend of Sheet and Strip

NEW YORK, May 29—The market for semi-finished steel, frequently used as a prop for sheet and strip prices, has responded to the price conditions prevailing in the sheet and strip-steel market and billets. Slabs and sheet bars are now quoted at \$31 @ \$32, Pittsburgh, Youngstown or Cleveland, as compared with the formerly prevailing price level of \$33. Pressure by non-integrated rollers of full-finished automobile sheets for sheet-bar prices more in line with the market for their product has been especially strong. Reports that full-finished body stock is now quotable at 3.70 cents, Pittsburgh, because of some sales in Detroit at that level, have been met by the statement that the 3.80 cents price continues effective in other markets.

It is extremely difficult these days to differentiate between price concessions in any one particular transaction and out-and-out market dips. This is especially the case when the tonnage, extras and the relations of a finishing mill with the consumer have as important a bearing on the desirability of an order as is the case just now. Tonnage buyers are few and far between, but whether one or two transactions make the market, easy as it is, is an open question. With the pace of demand as leisurely as can be, the normal summer let-down is not likely to be felt as much as it is in years in which there is a bulge in the demand during one time or another in the first half.

Pig Iron—The markets everywhere have turned extremely quiet. A gradual revival in interest on the part of automotive foundries is looked for as the end of the first half of the year draws nearer.

Aluminum—Shipments of aluminum from Canada last month were the lowest in two years, totaling 1,300,000 lb. as compared with a monthly average of 6,000,000 lb. in 1929. The market is marking time, the movement being entirely routine in character.

Copper—The market has turned dull. Producers are reported to be aiming at stabilization of the market on the present 13 cents, delivered Connecticut, basis. The "outside" market is a nominal affair with June-July-August quoted at 12.95 cents, delivered Connecticut.

Tin—After new lows had been reached in tin trading, the market steadied. End-of-the-month statistics are eagerly awaited. The National Metal Exchange will be closed on Saturday as well as Decoration Day.

Lead—Consuming demand is a shade more active. Prices rule steady.

Zinc—Quiet and easy.

Chrysler Adds Coupe

DETROIT, May 29—The addition of a convertible coupe with rumble seat to the new low-priced Chrysler six line has been announced by the Chrysler Sales Corp. The car, selling at a factory price of \$925, brings the total models in this series to six body styles. The convertible coupe has wood wheels as standard equipment. Wire wheels with spares in the front fender wells are available at additional cost. The seat cushions are upholstered in heavy tan leather. All exterior hardware of the car is chromium-plated.

Macauley Urges Rational Future Tariff Policies

Old Methods Inadequate for Protection of Export Production

NEW YORK, May 24—Stating the conviction that tariff wars with their consequent ill effects upon the employment of labor can only be averted by understanding, Alvan Macauley, president of the National Automobile Chamber of Commerce, urges that industry and agriculture should join in an effort to rationalize tariff policies of the future—"with a view to permitting as free an interchange of commodities between peoples and nations as the public interest of each country will permit."

Pending the changes in policies which he believes will come from a full consideration of the importance of foreign commerce to the continuance of employment here, Mr. Macauley says that the motor industry has been a unit in urging that Congress grant the President wide powers in dealing with specific tariff issues as they come and "dealing with them on the basis of fact rather than of opinion and with the interests of the whole country in mind rather than those of the individual."

Writing in the June issue of the current financial publication, Mr. Macauley says that tariff policies which have grown up in an era when the sole consideration was domestic trade cannot be adequate for the protection of American labor engaged in the production of articles for export.

Taking cognizance of the fact that "for various considerations, some of our industries, perhaps most of them, must have some tariff protection," he warns against rates which serve simply as subsidies to the unprogressive manufacturer and takes the position that "any industry or individual seeking a tariff should have to prove its necessities on the basis of fact and not on the basis of political finesse."

It is the conviction of the motor car manufacturers, he says, that tariff policies developed in an era when the sole consideration was domestic trade, cannot be adequate for the protection of American labor engaged in the production of articles for export.

Road Building Gains

WASHINGTON, May 27—Awards for highway construction during the first quarter of 1930 totaled \$196,678,000 and reflected a gain of 38 per cent over those for the corresponding period of last year, valued at \$142,668,000, according to Secretary of Commerce R. P. Lamont.

Chicago Association Meeting

CHICAGO, May 26—The annual meeting and election of directors of the Chicago Automobile Trade Association will be held Monday, June 9, in the Palmer House. This will be the 25th annual meeting, the silver anniversary of the association, and a program commemorative of the event has been prepared.

Eleven Years After

Seven men responsible for the first transatlantic flight in May, 1919, by the NC-4 were presented with medals on May 19 by President Hoover.

They were Commander John H. Towers, now assistant chief of the navy's Bureau of Aeronautics, who conceived and directed the flight; Commander Albert C. Reed, commanding officer of the seaplanes; Lieut. Commander Elmer F. Stone, pilot; former Lieutenant Walter Hinton, pilot; Lieutenant H. C. Rodd, radio operator; former Lieutenant J. L. Breeze, engineer, and Eugene S. Rhodes, engineer and chief aviation pilot.

Bendix Buys Marine Unit

NEW YORK, May 26—The Bendix Aviation Corporation has purchased outright the Charles Cory & Son Corporation, established for 90 years in the marine equipment industry.

Announcement of the purchase was made today by A. P. Homer, under whose management the concern will be operated as a division of the Bendix Corporation.

The purchase of the Cory Corporation marks the entrance of the automotive industry into the marine field, since the General Motors Corporation has a heavy interest in the Bendix enterprises. The Cory name will be maintained, however, the concern will remain exclusively in the marine and industrial fields and the existing personnel will be kept with the firm. With Mr. Homer, directors of the Bendix Corporation will be in charge, although new officials are expected to be announced later. All stock will be held by Bendix.

Stout to Select Scholars

DETROIT, May 27—William B. Stout, designer of Ford All-Metal Planes and head of Stout Air Lines, has been named for the board to select students from American colleges for the W. E. Boeing scholarships, which will approximate \$7,100 and to which more than 150 schools are eligible.

Detroit Aircraft Sales

DETROIT, May 26—Karl S. Betts, general sales manager of the Detroit Aircraft Corp., has announced the sale of 30 airplanes in the 30-day period from April 15 to May 15. The net sales amounted to \$195,048, and gross sales, \$249,800.

Carl Jernberg

CHICAGO, May 22—Funeral services for Carl Jernberg, 7846 Euclid Avenue, who died May 19, were held this week in the Englewood Swedish Baptist Church, with burial in Oak Hill. Mr. Jernberg was one of the founders and a director of the Standard Forging Company, Indiana Harbor. He was also a director in the Zerzome Corporation.

"Buy the Used Cars Right, Fix and Sell Them Fast"

Delay in Conditioning as Well as Irregular Appraisals Costly

CHICAGO, May 24—There is no mystery as to methods for selling used cars successfully, but it is difficult to understand why so few dealers employ them, Paul G. Hoffman, vice-president in charge of sales of the Studebaker Corporation of America, told members of the Chicago Automobile Trade Association at a luncheon meeting Friday, May 23. His subject was "The Successful Marketing of Used Cars."

Mr. Hoffman quoted C. A. Vane, general manager of the National Automobile Dealers Association, who summarized all the knowledge that had been gained from the experience of thousands of dealers in his advice to "buy 'em right, fix 'em fast and sell 'em quick."

"Buying 'em right involves, as every one agrees, a thorough selling and demonstration of the new car before offering an appraisal to a customer, and yet in a shopping tour made in Chicago within the previous week, an investigator secured 15 appraisals without accepting a single demonstration, and in only two cases was there an adequate effort made to present the advantages of the new car," Mr. Hoffman declared.

Furthermore, the appraisal was jumped from \$50 to \$200 after interviews not exceeding 30 minutes in duration in practically every case.

Mr. Vane's second precept, to "fix 'em fast," apparently is violated in almost the same proportion of cases, Mr. Hoffman found as a result of a recent investigation made of dealer establishments in different parts of the country. In only one case did the dealer carry out the factory injunction to start conditioning the used car within an hour of the time it was accepted in trade from the customer. Delay in conditioning, in Mr. Hoffman's opinion, is costing motor car dealers millions of dollars annually.

"Sell 'em quick," the third precept of Mr. Vane, is apparently interpreted by many dealers as "accept all offers," Mr. Hoffman said. In Chicago, out of 12 used car departments visited, only three dealers gave evidence of some stability of price. To really "sell 'em quick," the Studebaker executive pointed out, dealers should adopt and indorse a square-dealing, one-price policy that will create confidence.

Largest Steel Casting Ordered

CHICAGO, May 22—The largest single-piece steel casting ever made has been ordered from the Otis Steel Company by the Alliance Machine Company, Alliance, Ohio. The casting will weigh 230,000 lb. and will be an anvil base for a 12,000-lb. hammer. The hammer is being manufactured by the Alliance company for the Taylor Forge & Iron Company, Chicago. The casting will be 13 ft. long and nearly 7 ft. high, and its production will require nine weeks.

Steel Founders Adopt Standard Trade Customs

Arbitration of Claims Promotes More Equitable Relation

NEW YORK, May 24—The Steel Founders' Society of America, Inc., through their managing director, Granville P. Rogers, have adopted and issued a Standard Sales Agreement, Order Acceptance, Quotation Sheet, and a set of Standard Trade Customs for that industry.

The growth of this industry in recent years has made it desirable to clarify and simplify the many questions arising between buyers and sellers toward a more equitable understanding of contractual relations. It is anticipated that the buyer will be benefited by a standard practice which places all quotations and estimates on a known basis, and it also calls for uniform painting of patterns to indicate special treatment. The foundry's liability, inspection, shipping and terms are clearly stated and are the result of cumulative experience in solving these questions for the best interests of both parties. Arbitration of claims is a forward step in promoting a more equitable relationship between buyer and seller.

Cord to Pace Race

INDIANAPOLIS, IND., May 26—The honor of leading the 40 contenders for Decoration Day race prizes here May 30th on the Indianapolis Speedway has been given to a Cord front-drive car.

The pace-making car, a stock cabriolet model finished in faun with cream colored wheels, will be driven by Wade Morton of the Auburn Automobile Company. With Morton will ride T. E. Meyers, general manager of the Speedway.

Duesenberg New York Sales

INDIANAPOLIS, May 24—Sales of Duesenberg cars in New York City for the first 15 days of May broke all records for any similar periods with the Duesenberg Company of New York reporting a volume of more than \$125,000.

Carburetor for Fords

A new replacement carburetor for Model A Fords has just been placed on the market by the Wheeler-Schebler Carburetor Co., of Indianapolis, a subsidiary of Borg-Warner Corp.

Feature Issues of Chilton Class Journal Publications

Chilton Automotive Multi-Guide,
First Semi-annual Issue.

Ready about June 12

Automotive Industrial Red Book
In the mails next week

Ohio Sales Increase

COLUMBUS, OHIO, May 26—The Ohio Council, National Automobile Dealers Association, in a tabulation covering April sales of passenger cars in eight of the most populous counties of Ohio, shows a marked increase over the sale of March this year, although a falling off of approximately 33 per cent from sales in April, 1929. In the eight counties April passenger car sales totaled 14,436 as compared with 8947 in March. Sales during the first four months of the year were 36,759, a decline of 33 per cent from the corresponding period last year.

Ford led all other makes in the eight counties with 5806; Chevrolet was second with 2727; Pontiac was third with 686; Oldsmobile was fourth with 440, and Essex was fifth with 438.

Walter S. McKee

CHICAGO, May 24—Funeral services for Walter S. McKee, 406 Roslyn Place, president of the Kensington Steel Company, were held in the Fourth Presbyterian Church, with interment in Rosehill Cemetery. Mr. McKee died May 19, at the age of 54. He was a member of the American Society of Mechanical Engineers, the Chicago Club, the Chicago Athletic Association and the Skokie Country Club.

Panther Engine Approved

Announcement of the award of Department of Commerce Approved Type Certificate No. 49 for the MacClatchie "Panther," aviation's first successful L-head radial engine, developed by the MacClatchie Manufacturing Co., Compton, Calif., has just been made by J. Warren MacClatchie, president of the company.

Lower Insurance Rates in West Central Area

Underwriters Conference Announces Broad Changes in Application

CHICAGO, May 26—Lower insurance rates on automobiles for fire, theft, collision and property damage, as written by fire insurance companies, went into effect throughout the central western territory this week, coincident with the filing of rates by the several state inspection bureaus. The new schedules were compiled by the Western Automobile Underwriters Conference, a subdivision of the National Automobile Underwriters Conference.

The new rates, which are included in two manuals, have been considerably simplified and broadened also. The rates for property damage are included in a separate manual. An indication of the reductions accorded is found in a comparison of rates in Chicago for three popular makes of automobiles in separate price ranges.

For the Ford, the 1930 manual provides basic rates as follows: Fire, 40 cents a \$100 valuation; theft, \$5.45; collision, \$75 for full coverage, property damage, \$10. The 1929 rates were, fire, 55 cents a \$100; theft, \$8.95; collision, \$66 for full coverage; property damage, \$11.

For Buicks, the standard six, the 1930 rates are: fire, 25 cents a \$100; theft, \$7; collision, \$128 for full coverage, property damage, \$14. The 1929 rates were: 30 cents for fire, \$11.25 for theft, \$132 for full coverage collision, and \$13 for property damage.

The 1930 manual is considerably reduced in size as a result of reduction in number of age groups, elimination of collision differentials between open and closed cars, and in commercial automobile listings.

Marmon Adds Sedan

The addition to the Marmon Big Eight line of a five-passenger sportsman's convertible sedan, known as the Marmon Grand National, is announced by Thomas E. Jarrard, Marmon general sales director.

The new body style is a replica of a custom car designed for Mahmoud Sabit Bey of Cairo, Egypt. The body is by Locke on a standard Big Eight chassis and the price is \$3,895 at the factory.

Calendar of Coming Events

SHOWS

Berlin, International Automobile...Nov. 6-16

CONVENTIONS

National Automobile Chamber of Commerce, Annual Meeting, New York June 5

A. S. M. E., Semi-Annual Meeting, Detroit June 9-12

A. S. M. E., Oil, Power & Gas Div. State College, Pa. June 12-14

World Power Conference, Berlin June 16-25

Railway Supply Mfrs. Assn., Meeting and Exhibit, Atlantic City June 18-25

American Railway Association, San Francisco June 23-26

American Society for Testing Materials, Annual Meeting, Atlantic City June 23-27

Steel Founders Soc. (Midsummer Convention) White Sulphur Springs June 26-28

American Electroplaters' Society, Annual Meeting, Washington, D. C. June 30-July 3

Society of Automotive Engineers, Aeronautical, Chicago Aug. 26-28

Eastern States Exposition, Springfield, Mass. Sept. 14-20

National Safety Council, Annual Safety Congress, Pittsburgh Sept. 29-Oct. 4

Sixth International Road Congress, Washington, D. C. Oct. 6-11

Exhibition—American Roadbuilders Association, Washington, D. C. Oct. 6-11

Society of Automotive Engineers, Production, Book-Cadillac Hotel, Detroit Oct. 8-9

Society of Automotive Engineers, Transportation, Pittsburgh Oct. 22-24

Motor and Equipment Association, Convention, Cleveland Nov. 10-14

SALONS

Chicago, Drake Hotel Nov. 8-15

New York, Commodore Hotel Nov. 30-Dec. 6

RACES

Belgium July 5-6

Germany (Grand Prix) July 13

Belgium (European Grand Prix) July 20

Spain July 27

Italy (Grand Prix) Sept. 7

France (Grand Prix) Sept. 21